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Note: This Health and Safety Plan incorporates the Health and Safety Plan for Operations Performed for the Environmental Restoration Program, (EGG-WM-8771, Revision 2), with Appendix A completed for the Characterization of Potential Waste Sources at Auxiliary Reactor Area-1 Operable Unit 5-07 Site ARA-02

HEALTH AND SAFETY PLAN
FOR
OPERATIONS PERFORMED FOR THE
ENVIRONMENTAL RESTORATION PROGRAM

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DISCLAIMER

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HEALTH AND SAFETY PLAN
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ENVIRONMENTAL RESTORATION PROGRAM

Apprcved by:

S. G. Stiger, Manager
Environmental Restoration Program — 6-21-91 Date

Reviewed by:

J. P. Shea, Chairman
ERP Independent Review Committee — 6/21/91 Date

for D. E. Minner, Occupational Medical Program — 6/21/91 Date

DOE-ID approval letter for this Health and Safety Plan is attached to DRR number ERP-340, dated 6/21/91.

ABSTRACT

This document constitutes the generic health and safety plan for the Environmental Restoration Program (ERP). It addresses the health and safety requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120 standard; and EG&G Idaho, Inc. This plan is a guide to individuals who must complete a health and safety plan for a task performed for the ERP. It contains a task specific addendum that, when completed, specifically addresses task specific health and safety issues. This health and safety plan reduces the time it takes to write a task specific health and safety plan by providing discussions of requirements, guidance on where specific information is located, and specific topics in the Addendum that must be discussed at a task level. This format encourages a complete task specific health and safety plan and a standard for all health and safety plans written for ERP.

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ACRONYMS, ABBREVIATIONS, and DEFINITIONS

Acronyms:

ALARA	As Low As Reasonably Achievable
ANSI	American National Standards Institute
ARDC	Administrative Record and Document Control
anti-c	Anti-contamination
CA	Compliance Assurance
CERCLA	Comprehensive Environmental Response Compensation, and Liability Act
CFA	Central Facilities Area
CFR	Code of Federal Regulations
COCA	Consent Order and Compliance Agreement
CPR	Cardiopulmonary Resuscitation
DOE	Department of Energy
DOE-ID	Department of Energy - Idaho Operations Office of DOE
DOP	Detailed Operating Procedure
DOT	Department of Transportation
DRD	Direct Reading Dosimeter
DRR	Document Revision Request
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
FTL	Field Team Leader
H&S	Health and Safety
HAZMAT	Hazardous Materials Response
HPT	Health Physics Technician
HSO	Health and Safety Officer
HW	Hazardous Waste
IAG	Interagency Agreement
IH	Industrial Hygienist
INEL	Idaho National Engineering Laboratory
LEL	Lower Explosive Limit
MSDS	Material Safety Data Sheets
NEPA	National Environmental Policy Act
NIOSH	National Institute for Occupational Safety and Health
NRTS	National Reactor Testing Station
OMP	Occupational Medical Program
OSHA	Occupational Safety and Health Administration
PD	Program Directive
PM	Project Manager
PPE	Personal Protective Equipment
QE	Quality Engineer
QPP	Quality Program Plan
QAPjP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RE	Radiological Engineer
SAP	Sampling and Analysis Plan
SCBA	Self-contained Breathing Apparatus
SE	Safety Engineer

SOP	Standard Operating Procedure
SSWP	Special Safe Work Permit
SWIMS	Solid Waste Information Management System
SWP	Safe Work Permit
TLD	Thermoluminescent Dosimeter
TRU	Transuranic
USCG	United States Coast Guard

Abbreviations:

NIOSH, 10/85--NIOSH/OSHA/USCG/EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, October 1985.

Definitions:

Action Limit--Any physical, chemical, or radiological limit set by a regulatory agency, EG&G Idaho, Inc., or safety individual at the task site.

Area--A geographic subdivision of the INEL or a location outside the INEL dependent on the INEL for logistical or administrative support (e.g., TAN, TRA, CFA, IF).

Facility--The minimum complete and usable unit of Real Property designed to contain an organizational unit or operational function (e.g., building, central steam station).

Hazardous Material Response (HAZMAT) employee--Member of a group of employees, designated by management, who is expected to perform work to handle and control actual or potential leaks or spills of hazardous substances requiring possible close approach to the substance. The HAZMAT Team performs responses to releases or potential releases of hazardous substances for the purpose of control or stabilization of an incident. A HAZMAT Team is not a fire brigade nor is a typical fire brigade a HAZMAT Team. A HAZMAT Team, however, may be a separate component of a fire brigade or fire department.

Task Site--Immediate working area where ERP task operations are being performed.

HEALTH AND SAFETY PLAN
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1. INTRODUCTION

This Health and Safety (H&S) Plan for operations performed for the EG&G Idaho, Inc. Environmental Restoration Program (ERP) establishes the procedures and provides general guidelines to minimize health and safety risks to the worker and public. This plan, in conjunction with associated task specific information required by this plan, shall be used during selected activities aimed at assessing and remediating past hazardous waste and/or hazardous substance disposal at the Idaho National Engineering Laboratory (INEL).

This H&S Plan and the associated task specific addendum required by this plan shall be in accordance with the Occupational Safety and Health Administration (OSHA), 29 CFR 1910.120 standard governing hazardous waste operations. It has been prepared in recognition of and is consistent with the NIOSH/OSHA/USCG/EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, October 1985 (hereafter referenced as NIOSH, 10/85); the EG&G Idaho Company Procedures Manual; the EG&G Idaho Safety Manual; and the EG&G Idaho Radiological Controls Manual.

This H&S Plan shall be used when work is performed at ERP task investigation sites by employees of EG&G Idaho, subcontractors to EG&G Idaho and employees of other firms, and Department of Energy (DOE) Laboratories. Occasional visitors and oversight personnel [DOE, State of Idaho, and Environmental Protection Agency (EPA) representatives] are subject to the requirements of Section 2.16 of this plan.

1.1 H&S Plan Task Specific Addendum

This H&S Plan must address the many diverse conditions encountered for each task included in the ERP investigations. Therefore, an addendum shall be written for each task that requires an H&S Plan. The task addendum shall include any additions, omissions, or modifications to the main body of this H&S Plan that can individualize this plan into a task specific plan. The task specific plan need not repeat EG&G Idaho or ERP procedures for safety and health. However, these procedures shall be referenced in the Addendum.

NOTE: If an existing document meets the intent of the task specific plan [e.g., Detailed Operating Procedure (DOP)], it may be attached as the Addendum to this H&S Plan. The following statement must then be included at the beginning of the task specific addendum: "The information contained in this document contains all the elements required by the task specific addendum and therefore replaces the stated addendum." If an existing document is used for the addendum, it does not have to be in the specified format of the addendum. The task specific H&S Plan will be considered complete when the H&S Plan task addendum is reviewed and approved per ERP Program Directive (PD) 2.2.

Upon request, a copy of this generic H&S Plan and an electronic copy of the generic H&S Plan task specific addendum may be obtained from the ERP Administrative Record and Document Control Office (ARDC, 526-2650). At a minimum, the generic H&S Plan shall be reviewed annually and revised as required; therefore the requester shall verify the revision number of the generic H&S Plan with ARDC. The electronic copy of the task specific addendum is provided as a guide in producing a task specific H&S Plan. Pertinent topics referencing the main body of this H&S Plan are provided in the electronic copy of the blank H&S Plan task specific addendum to aid the author in writing a complete task specific H&S Plan.

When the electronic guide is used to produce a task specific addendum, each topic must be evaluated to determine how it applies to the specific task requiring the addendum. If the topic does not apply to the subject task, "N/A" shall be written in that portion of the task specific addendum. If additional information is required to make a complete task specific H&S Plan, additional blank pages may be added at the end of the task specific addendum. All technical information requested in the addendum must be obtained from knowledgeable individuals associated with the specific task [e.g., monitoring equipment information should be obtained from the task radiological engineer (RE) and/or industrial hygienist (IH)]. Once a task specific addendum is completed in accordance with ERP PD 4.4 and reviewed and approved in accordance with ERP PD 2.2, it shall be sent to ARDC, appended onto the generic H&S Plan and processed. ARDC is responsible for maintaining the electronic copy and originals of the task specific H&S Plans.

Any modifications to an approved task specific plan shall be implemented through a Document Revision Request (DRR), as described in ERP PD 4.1. If the change is made in an existing document used as a task specific plan but the document is not an ERP document, the changes will be made in accordance with the directives of the program/facility responsible for the document. Documentation of any changes made to documents external to ERP must be provided to ARDC.

1.2 Site Description

INEL is a multipurpose laboratory originally established in 1949 by the U.S. Government, under the direction of the Idaho Operations Office of the Department of Energy (DOE-ID). The primary mission of INEL is to support the engineering and operations efforts of DOE and other federal agencies in areas of nuclear safety research, reactor development, reactor operations and training, nuclear defense materials production, waste management and technology development, and energy technology/conservation programs.

INEL, formerly the National Reactor Testing Station (NRTS), encompasses 890 square miles and is located approximately 20 miles west of Idaho Falls, Idaho (Figure 1-1). The United States Atomic Energy Commission, now DOE, established the NRTS in 1949 as a site for building and testing a variety of nuclear facilities. INEL has also been the storage facility of transuranic (TRU) radionuclides and low-level radioactive wastes since 1952. DOE-ID has responsibility for the INEL and designates authority to operate the INEL to government contractors. The primary contractor for DOE-ID at INEL is EG&G Idaho, Inc. which provides managing and operating services to the majority of INEL facilities. Other contractors who operate facilities at the INEL but are not covered by this H&S Plan include Westinghouse Idaho Nuclear Company, Argonne National Engineering Laboratory, Westinghouse Electric Corporation, and Rockwell Corporation.

Tasks being performed for the ERP are scattered throughout INEL, and detailed facility or task site descriptions are too numerous to include in this generic portion of the H&S Plan. Therefore, specific facility and/or task site descriptions shall be provided in the task specific addendum.

1.3 Scope of Work

ERP supports the following objectives identified in Chapter 2 of the Management Plan for the EG&G Idaho Environmental Restoration Program:

- Identify and remediate all past waste units presenting a potential threat to human health or the environment.

- Comply with the Consent Order and Compliance Agreement (COCA), which will be the integration document for INEL cleanup activities, by implementing the COCA Action Plan. Comply with the Interagency Agreement (IAG) when approved by DOE, Environmental Protection Agency (EPA) Region 10, and the State of Idaho.

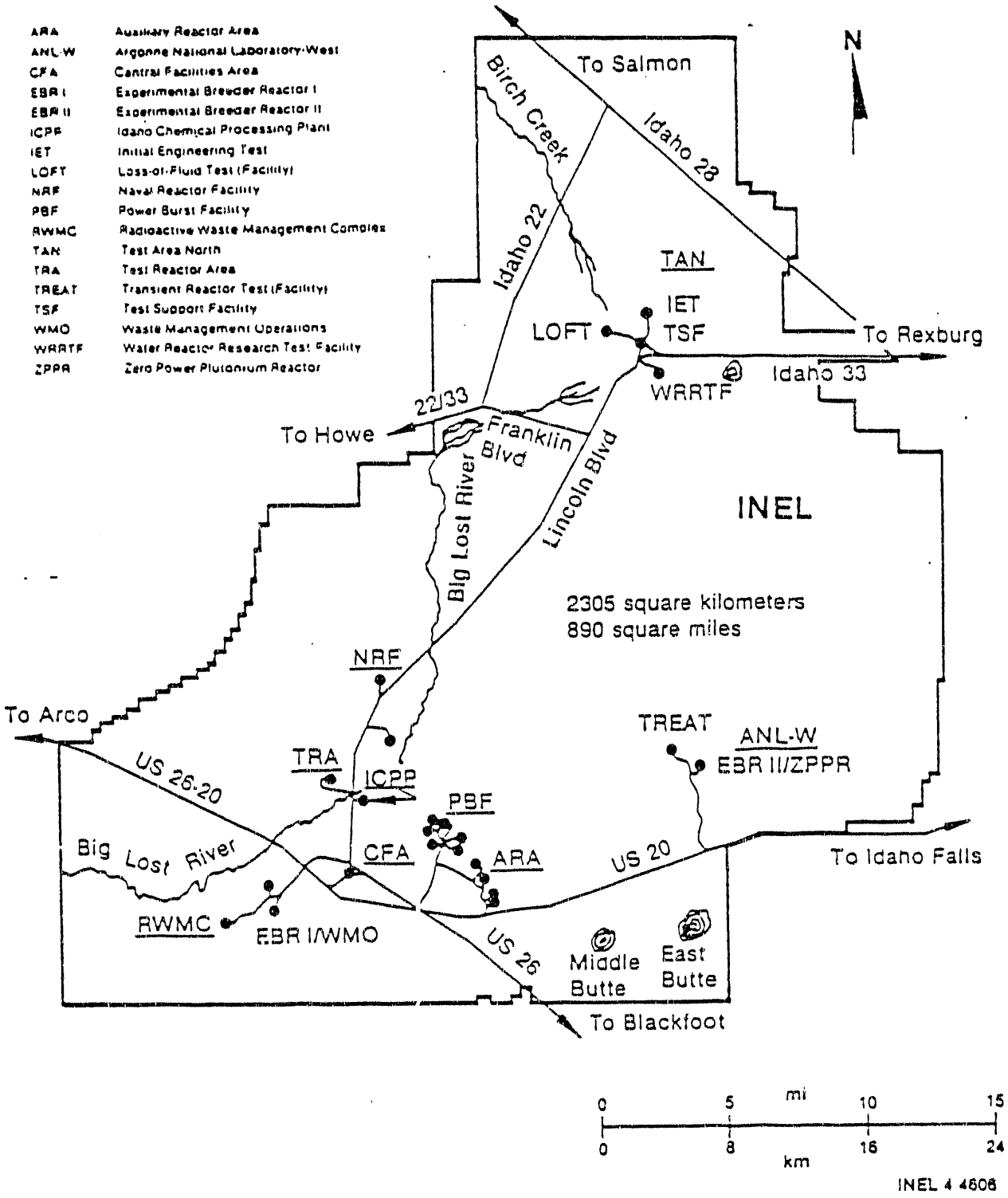

Figure 1-1. Map of INEL showing location of the major facilities.

- Comply with the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA) as established in an IAG among DOE-ID, EPA, and the State of Idaho.

- Support the DOE Environmental Restoration Program, as directed by DOE Headquarters in Washington, D.C.

A detailed work scope shall be included in the task specific addendum.

Field activities conducted during investigations may result in an exposure to hazardous and/or radioactive materials or wastes resulting from direct contact with contaminated soil, rock, groundwater, airborne particulates, and vapors. Protecting task site personnel from occupational health and safety hazards will be of major concern during the field activities. To this end, the ERP has identified a number of subjects that will provide protection to personnel and the environment. The following major subjects are addressed:

- Health and safety responsibilities

- Personnel training

- Medical surveillance program

- Hazard evaluation

- Levels of protection and use of personal protective equipment (PPE)

- Safe work practices

- Establishment of work zones, site entry, and security procedures

- Personnel and environmental monitoring and record keeping requirements
- Decontamination procedures
- Emergency procedures, equipment, and information.

Each subject is detailed in the following sections.

2. HEALTH AND SAFETY RESPONSIBILITIES

Direct implementation of the H&S Plan is the responsibility of the Field Team Leader (FTL). The FTL and/or Project Manager (PM) shall determine the task organizational structure and expertise required to perform the task while minimizing any risks to personnel health and safety. Expertise that may be required for the task includes but is not limited to industrial hygiene, health physics, industrial safety, and essential technical skills. The FTL shall develop a task organizational chart that identifies all key personnel. Both lines of command and lines of communication shall be identified by the task organizational chart (see Figure 2-1). The task organizational chart shall be located in the addendum. A qualified person may act in dual positions for a task [e.g., IH and health and safety officer (HSO)]. An HSO shall always be identified for a task per the requirements of OSHA 1910.120. The following subsections outline the responsibilities of the most common key personnel. If warranted by the requirements of the task, additional specialized positions may be necessary.

2.1 Field Team Leader

The FTL, the individual overseeing task activities, has ultimate responsibility for the safe and successful completion of task activities and for all phases of safety at the task site. If operations have been halted due to a potentially hazardous health and safety issue, the FTL will confer with the IH, HSO, RE, PM, health physics technician (HPT), safety engineer (SE), and facility representative, as required by the situation, to provide a safe solution to the problem. In addition, the FTL must remain responsive to health and safety issues raised by task operations personnel.

The FTL will ensure an orientation meeting is conducted before the start of a task to review and discuss operating procedures and the Task Specific H&S Plan (including any attachments) with task operations personnel. If new team

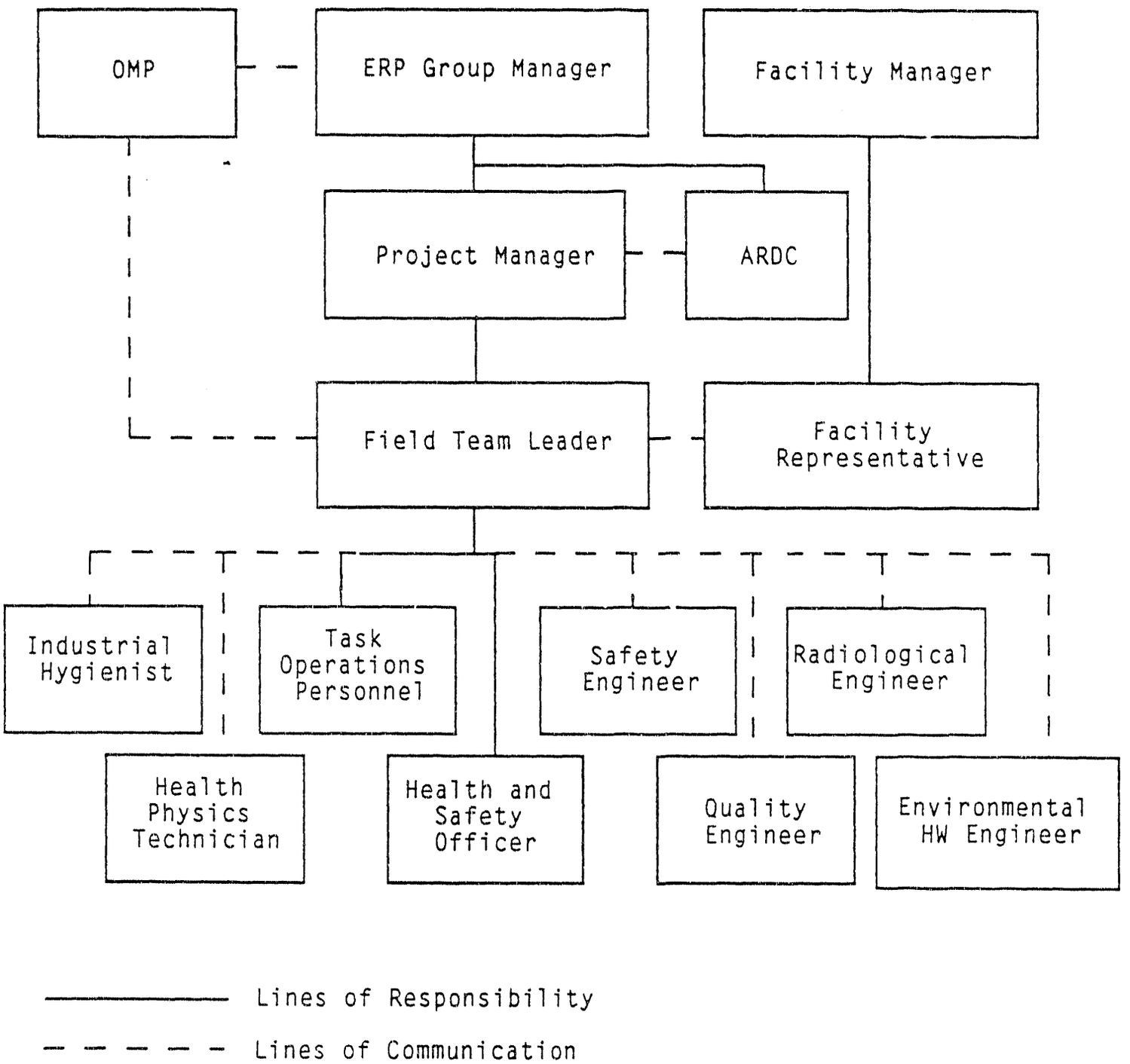

Figure 2-1. Field organizational chart.

members arrive at the task site after initiation of the task, the FTL shall ensure this orientation is presented to them.

At the beginning of each work day, the FTL (or alternate) will meet with task operations personnel to discuss the day's activities and address any health and safety issues that may have arisen or potentially could arise that day.

The FTL will ensure that all task operations personnel have received the appropriate training as required by Section 3 of this H&S Plan and that records of training for ERP personnel (including a copy of the signed Health and Safety Certification form as shown in the addendum) are submitted to the Training and Emergency Action Unit of the Waste Management Operations Support Group.

Additional responsibilities of the FTL include:

- Halting or modifying any task and/or evacuating the task site if work conditions are considered unsafe. This decision will be made after consulting with the HSO, IH, SE, and/or RE, as appropriate

- Reporting any accident, illness, or safety-related occurrence in accordance with Section 3 of the EG&G Idaho Safety Manual.

- Notifying the facility representative (if applicable) of any modifications or suspension of the task

- Ensuring that an interface exists with the analytical laboratories regarding any analyses of personnel monitoring and/or ambient air samples and provisions are made with the laboratory for a 24 to 48-hour turnaround for analysis in the event of an exposure suspected of being above an action level.

- Ensuring that all task site personnel understand and comply with all safety requirements

- Initiating corrective action for observed safety violations

- Ensuring that safety training is implemented as described in this plan (Section 3).

An FTL not at the task site must appoint an appropriate alternate to act as FTL. This change must be communicated to the facility representative, when necessary, and recorded in the FTL logbook. Appropriate alternates shall be listed in the task specific addendum.

2.2 Health and Safety Officer

The HSO is responsible for ensuring compliance with and the execution of the health and safety procedures described in this plan and the associated task specific addendum. The HSO will be supported by those personnel necessary to effectively implement the task specific H&S Plan and verify compliance (e.g., SE, IH, HPT, RE, and facility representative).

Responsibilities of the HSO include:

- Ensuring that all necessary safety equipment is located on or near the task site and properly maintained and calibrated by the appropriate personnel.

- Observing task site activities and reporting any deviations from the H&S Plan to the FTL

- Initiating contact with the INEL emergency response agencies (security, fire, medical) at the beginning of the task, ensuring personnel and environmental monitoring requirements are established

by the IH and RE (Section 9), and testing the emergency phone numbers to ensure accuracy.

2.3 Industrial Hygienist

The IH is the primary source of information regarding health issues at the task site. The IH is responsible for operations and maintenance of all monitoring equipment with the exception of radiological equipment and will maintain a daily logbook of monitoring activities. The IH will conduct task site health hazard assessments and advise the FTL on adequate health protection for task operations personnel. The IH will advise the FTL on changes to monitoring or PPE requirements throughout task activities and on any conditions necessitating task site evacuation and permitting personnel reentry to the task site.

The IH is responsible for designing a practical monitoring program to determine worker exposures to hazardous substances. The IH will also log results from field samples and observations.

NOTE: Much uncertainty is involved as to the chemical hazards that may be encountered. Not everything can be monitored, and professional judgment must be exercised at all times.

The IH shall aid the FTL in identifying employees experiencing adverse health effects that may have resulted from exposure to hazardous substances and environments and identifying such workers to the Occupational Medical Program (OMP).

2.4 Health Physics Technician

The HPT is the primary source of information and guidance with regards to radiological hazards. The HPT will be present at the task site before

operations begin and at any point during task operations when a radiological hazard to operations personnel may exist or is anticipated.

Responsibilities of the HPT include:

- Ensuring radiological equipment is calibrated and functioning properly
- Radiological surveying of the task site, equipment (before and after decontamination), and samples
- Collecting and analyzing smears
- Providing guidance and monitoring decontamination of equipment (radiological contaminants)
- Providing the FTL, CMP, and RE with radiological monitoring information as requested
- Immediately notifying the FTL of any radiological occurrence that must be reported as directed by the EG&G Idaho Safety Manual, Section 3, Appendix II.
- Accompanying victim to the nearest INEL Medical Facility for evaluation if significant radiological contamination occurs.

2.5 Radiological Engineer

The RE is the primary source of information and guidance for radiological controls imposed on a task. The RE will make recommendations to minimize health and safety risks of task operations personnel if a radiological hazard exists or occurs at a task site.

The responsibilities of the RE include:

- Performing radiation exposure estimates using information provided by cognizant engineers, area HPTs, history of past work evaluations, bioassays, FTLs, etc.

- Identifying the type(s) of radiological monitoring equipment necessary to maintain safe working conditions for task operations personnel

- Attending pre-job briefings if required by the FTL

- Advising FTL and HPT of changes in monitoring or PPE and task site evacuation and reentry.

2.6 Administrative Record and Document Control Office

The ARDC is responsible for organizing and maintaining data and reports (safety, sampling, and operations) generated by ERP investigations. ARDC maintains a supply of all controlled documents and provides a documented checkout system for the control and release of controlled documents, reports, and records. A copy of the H&S Plan and the associated electronic copy of the task specific addendum are available upon request by calling 526-2650.

2.7 Occupational Medical Program

The OMP is mandated by DOE 5480.8 and uses the sciences related to preventive medicine and environmental health to determine the effects of environmental stress on human health or disease.

The OMP has responsibilities in the following areas:

- Review and comment on INEL emergency plans and operations

- Provide diagnosis, medical opinion, and treatment for INEL employees with occupational or nonoccupational illness or injuries

- Assist in the documentation and investigation of work-related illnesses or injuries

- Provide medical opinion whenever there is doubt by the FTL, advisors, or employee of the ability of the employee to perform assigned work or work being considered for assignment

- Plan and provide emergency medical care in support of individuals and Area emergency actions

- Maintain and operate a radiation and chemical decontamination facility at Central Facilities Area (CFA)

- Provide medical surveillance of workers who are identified by an IH as having been or are likely to be exposed over action levels to specific hazardous environments or substances.

2.8 Facility Representative

The facility representative serves as the Area Landlord representative and is responsible for the safety of personnel and safe completion of all project activities conducted within his/her Area. Therefore, the facility representative will be kept informed of all activities performed in the Area. Where applicable, the facility representative and FTL shall agree upon a schedule for reporting task progress and plans for work. The facility representative will serve as advisor to task operations personnel with regard to the Area operations when the task is performed in his/her Area.

2.9 ERP Group Manager

The ERP Group Manager is responsible for investigation and remediation activities performed by ERP. This manager provides technical coordination and interfaces with the DOE-ID Environmental Support Office. The ERP Group Manager ensures that all activities are conducted in accordance with DOE, EPA, and State of Idaho requirements and agreements; monitors and approves program budgets and schedules; ensures the availability of necessary personnel, equipment, subcontractors, and services; and provides direction for the development of tasks, evaluation of findings, development of conclusions and recommendations, and production of reports. The ERP Group Manager has primary responsibility for the technical quality of all projects and safety of personnel.

2.10 Project Manager

The PM has the responsibility for ensuring that all tasks conducted during the project are in compliance with the Management Plan for the EG&G Idaho Environmental Restoration Program and all applicable OSHA, EPA, DOE, Department of Transportation (DOT), and State of Idaho requirements. The PM is responsible for ensuring tasks comply with the ERP Quality Program Plan (QPP) (QPP-149), Quality Assurance Project Plan (QAPjP), H&S Plan, PDs, and Sampling and Analysis Plans (SAPs) of ERP. The PM coordinates all field, laboratory, and modeling activities.

2.11 Facility Manager

The Facility Manager is responsible for managing all aspects of the Area in his charge. The Facility Manager must be cognizant of work being conducted in the Area.

2.12 Environmental Hazardous Waste Engineer

The Environmental Hazardous Waste (HW) Engineer oversees, monitors, and advises EG&G Idaho organizations performing field activities at the INEL. Responsibilities include ensuring compliance with DOE Orders, EPA regulations, and other regulations concerning effects of activities on the environment. Additional responsibilities of the HW Engineer include:

- Acting as advisor for environmental concerns associated with ERP task activities
- Maintaining a library of applicable environmental information
- Disseminating applicable environmental information where/when needed.

2.13 Safety Engineer

The SE offers guidance on all safety issues arising at the task site, observes tasks and advises the FTL on required safety equipment necessary to promote a safe work environment, advises FTL and HSO about safety concerns arising during task operations, and recommends solutions to any concerns.

2.14 Quality Engineer

The Quality Engineer (QE) provides guidance on task site quality issues when requested. The QE observes task site activities and verifies that task operations comply with quality requirements pertaining to these activities. The QE identifies activities that do not or have the potential for not complying with quality requirements and suggests corrective actions for such activities.

2.15 Task Operations Personnel

All task operations personnel, including EG&G and subcontractor personnel, are responsible for understanding and complying with requirements of the task specific H&S Plan. Task operations personnel will be briefed by the FTL before starting each day's activities. They should identify and discuss potentially unsafe task site activities or conditions with the FTL for corrective action. If unsafe conditions develop, task operations personnel are authorized to halt work and notify the FTL of the unsafe condition.

2.16 Oversight Personnel and Visitors

Oversight personnel (i.e., DOE-ID, EPA, and State of Idaho representative) and visitors shall be considered "workers on site only occasionally." To minimize risks that may result from task site activities, "workers on site only occasionally" must have official business and notify the FTL before entering the task site. All "workers on site only occasionally" shall follow the requirements of OSHA 1910.120(d)(3)(ii) which states:

> Workers on site only occasionally for a specific limited task (such as, but not limited to, groundwater monitoring, land surveying, or geo-physical surveying) and who are unlikely to be exposed over permissible exposure limits and published exposure limits shall receive a minimum of 24 hours of instruction off the site, and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

If these individuals meet the requirements stated above, they may not proceed beyond the support zone without receiving a safety briefing and wearing the appropriate protective equipment.

3. PERSONNEL TRAINING

Task operations personnel classified by the PM and/or FTL as hazardous material workers shall receive hazardous material worker training as specified by OSHA 29 CFR 1910.120 and the EG&G Idaho Safety Manual, Section 8. Specific training requirements for each hazardous material worker may vary depending on the hazards associated with the job assignment (e.g., noise, radiation). All hazardous material workers must obtain OSHA Hazardous Waste Operator training. Additional training to be considered for hazardous material workers includes but is not limited to:

- Respirator Fit Test Qualification
- Radiation Worker
- Hearing Conservation.

In addition to the above mentioned training, at least one worker with Medic 1st [Cardiopulmonary Resuscitation (CPR) and First Aid] training shall be present at the task site when task operations personnel are present. Managers of hazardous material workers (e.g., PM, FTL) shall obtain Hazardous Waste Worker Supervisor Training. Additional safety training courses may be required as dictated by the job assignment. Section 8 of the EG&G Idaho Safety Manual contains course numbers and descriptions for all EG&G safety training courses.

Employees who attend training classes requiring an annual refresher course must attend the annual courses for as long as they remain active hazardous material workers. Proof of completion of all required training courses by employees and visitors must be provided to the Training and Emergency Action Unit of the Waste Management Operations Support Group. ERP personnel can also obtain information regarding ERP personnel training records

(e.g., due dates of refresher courses) from the Training and Emergency Action Unit of the Waste Management Operations Support Group.

The FTL will ensure that all task operations personnel understand the specific site hazards associated with each task at the daily briefings. Each FTL will also design and ensure implementation of a task specific training orientation to inform task operations personnel about the unique hazards or procedures, task specific H&S Plan, DOPs, etc. associated with the task at hand. Table 3-1 summarizes the above mentioned training requirements.

The following outline shall be used as a guideline for training and orientation before the start of a task. Personnel working at the task site shall be informed of the information listed in this outline, as applicable to the specific task.

A. WORK PLAN (SAP, Test Plan, etc.)

B. HEALTH AND SAFETY ITEMS

1. Personnel responsibilities

2. Medical program

3. Task site work zones

4. Vehicle operation and parking

5. Task site air and radiological monitoring

   a. Monitoring equipment (task site and personal)
   b. Calibration
   c. Maintenance and decontamination procedures

TABLE 3-1. Training topics for ERP hazardous material workers[a]

Training Topic[b]	Personnel Job Description	Task Operations Personnel	Field Managers
OSHA Hazardous Waste Operator	Cleanup or operations of hazardous waste sites	R	R
Respirator Fit Test Qualification	Work area requires use of respirator	R	R
Radiation Worker	Level of radiation exposure determines training category	R	R
Medic 1st	First Aid, CPR	R*	O
Personal Protective Clothing and Equipment	Required to wear Chemical and/or Radiological	R	R
Site Specific Hazards (FTL develops this training)	Encounters task specific potential hazards	R	Develop
Decontamination	Chemical and/or Radiological Procedures	R	R
Hearing Conservation	IH determines exposure to noise above 8-hour time-weighted average of 85 decibels	R	R
Emergency Training	Knowledge of Area drills, rescue, response, information	R	R

R: Required
O: Optional
*: At least one worker with Medic 1st Training shall be at task site when task operations personnel are present.

a. Additional training may be required for each task or individual and should be listed in the addendum.
b. These training topics include both the initial and refresher training (See EG&G Idaho Safety Manual, Section 8 for specific safety training course descriptions and numbers).

B. HEALTH AND SAFETY ITEMS (continued)

6. Potential hazardous contaminants and chemical hazards (toxicity and symptoms) present at the task site

7. Potential radiological contaminants

8. Task Specific Hazard Communication (in addition to the General Hazard Communication) training

   a. Inventory of hazardous agents
   b. Material Safety Data Sheets (MSDSs)
   c. Container labeling
   d. Informing visitors
   e. Contractor inventory and MSDSs

9. Contingency plans and responses

   a. Spill control
   b. Work stoppage

10. Use of field equipment and supplies

   a. Drilling equipment
   b. Work tools
   c. Sampling equipment
   d. Decontamination of equipment and supplies

11. Task site control and security

12. Buddy system and hand signals

B. HEALTH AND SAFETY ITEMS (continued)

13. Work limitations

a. Weather
b. Fatigue
c. Heat stress
d. Cold stress
e. Hours of work
f. Illumination
g. Lightning

C. PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING

1. General

2. Availability

3. Level D PPE and clothing, as defined by OSHA, including limitations of protection

a. Work clothing
b. Eye protection
c. Foot protection
d. Head protection
e. Hearing protection

4. Level C PPE and clothing, as defined by OSHA, including limitations of protection

a. Respiratory protection
b. Work clothing
c. Eye protection

C. PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING (continued)

d. Foot protection
e. Head protection
f. Hearing protection
g. Skin/hand protection

5. Level B PPE and clothing, as defined by OSHA, including limitations of protection

a. Air supplied hood or self-contained breathing apparatus (SCBA)
b. Disposable, chemically resistant coveralls
c. Anti-contamination (anti-c) clothing as recommended by the RE
d. Chemically resistant safety shoes with steel toe
e. Chemically resistant shoe covers
f. Hard hat
g. Inner and outer chemically resistant gloves
h. Hearing protection, as required by IH

6. Level A PPE and clothing, as defined by OSHA, including limitations of protection

a. SCBA
b. Fully encapsulating, chemically resistant suit
c. Additional anti-c clothing, as recommended by the RE
d. Chemically resistant safety shoes with steel toe
e. Chemically resistant shoe covers
f. Hard hat
g. Inner chemically resistant gloves
h. Hearing protection, as required by IH

C. PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING (continued)

7. Zone I anti-c clothing minimum requirements

   a. One pair cloth anti-c coveralls (or disposable) (as required by HPT)
   b. One yellow cloth hood (or disposable)
   c. Two pair shoe covers
   d. One pair latex gloves and cloth glove liners

8. Zone II anti-c clothing minimum requirements

   a. One pair yellow cloth anti-c coveralls (or disposable)
   b. One yellow cloth hood (or disposable)
   c. Three pairs shoe covers (two pairs must be vinyl)
   d. One pair latex gloves and cloth glove liners

9. Zone III anti-c clothing minimum requirements

   a. One pair yellow cloth anti-c coveralls and head cover (hood)
   b. One pair disposable anti-c coveralls (or plastic anti-c suit) with disposable hood
   c. Three pairs shoe covers (two pairs must be vinyl)
   d. Two pairs gloves and cloth glove liners
   e. Respiratory protection commensurate with the contamination levels

10. Decontamination procedures

   a. Chemical contaminants
   b. Radiological contaminants
   c. Mixed contaminants

D. EMERGENCY ASSISTANCE

1. Availability of emergency services and location of telephone and telephone numbers, MSDSs, and other emergency information

2. Transportation of emergency cases and accompanying medical monitoring procedures

3. Emergency assistance and review of hand and audible signals

E. SPECIAL PRECAUTIONS DURING TASK SPECIFIC OPERATIONS

1. Most dangerous times

2. Most dangerous conditions

3. Specific task checklist.

In addition, the FTL will conduct safety briefings (a) at the beginning of each shift, (b) whenever new personnel arrive at the task site, and (c) as significant changes to task site or work conditions occur.

4. MEDICAL SURVEILLANCE PROGRAM

Employees identified as hazardous waste workers as defined by OSHA (29 CFR 1910.120) require medical surveillance examinations prior to beginning duties, annually, and at the termination of hazardous waste duties (if they have not had such an examination within a year). This includes (a) employees who are or who may be exposed to hazardous substances at or above established permissible exposure limits, without regard to respirator use, for 30 or more days per year; (b) those who wear a respirator for 30 or more days per year; and (c) all HAZMAT employees. In addition, employees who must use a respirator in their job or are required to take training to use a respirator to perform their duties under this plan must be medically evaluated for respirator use at least annually.

The OMP is responsible for evaluating the physical ability of a worker to perform the task assigned. The OMP provides medical clearance to the worker for the work to be performed. The OMP may impose restrictions on the employee by limiting the amount or type of work performed. The PM (or the IH and/or HP with the approval of PM) must provide the job related background information listed below to the OMP for each hazardous material worker. This information must be submitted to the OMP before work begins and annually, one month before birth date of the employee to maintain hazardous waste/hazardous material worker medical clearance. It may be submitted on EG&G Form 3044, "Hazardous Material Worker Job Related Background Information;" EG&G Form 735, "Industrial Hygiene Identification Of An Employee For A Medical Surveillance Program To OMP;" or by other means acceptable to the OMP.

- Medical history and physical examination
  - Preemployment medical examination, for full-time employees
  - Current comprehensive medical examinations, for full-time employees, in an INEL medical facility

- Records and reports from employees' private physicians, as required by the Site Occupational Medical Director

- Medical evaluation by OMP on return to work following an absence in excess of one work week (40 consecutive work hours) resulting from illness or injury

- Medical evaluation in the event a supervisor questions the physical condition of an employee

- Medical evaluation in the event the employee questions his/her physical condition

• Job related background information (Form EG&G-3044)

- What type of job does the individual perform?

- When was the individual first exposed to hazardous substances or working in an environment with potential hazardous exposure at the INEL?

- Relevant environmental monitoring (IH and HPT) data including sample dates and places (if the employee has been exposed to substances or physical agents above an action level)

- How and when was/will the employee (be) trained in PPE including respirators?

- What type of respiratory protective device is to be used?

- How many days per month is respiratory protection to be used?

- How long is this work to continue?

The above information and examinations are used to determine the following for each employee:

- Ability to perform routine occupational tasks
- Work in protective equipment and/or heat stress environments
- Use of respiratory protection
- Need to be entered into additional specific medical surveillance examination programs.

Employees are cleared as hazardous material workers with or without specific restrictions relating to heat stress, certain job tasks, and/or use of respirators. If the OMP does not have sufficient information at the time of request for clearance for respirator training, the supervisor is notified and clearance is withheld until the needed information is provided and any necessary additional examination or testing is completed.

Results of the following tests shall be made available to the OMP when any abnormal exposure is noted or a radiological contamination incident occurs:

- Whole body count (baseline, annual, and on actual or suspected radiological contamination incident)
- Bioassay (baseline, as required to assess internal radiation dose, and on actual or suspected radiological contamination incident).

Subcontractors are responsible for being in compliance with health and safety requirements as stated in 29 CFR 1910.120. All medical data collected pursuant to hazardous material worker qualification of a subcontractor worker shall be made available to the OMP. Background information about the

subcontractor worker will assist the OMP in assessing the medical ability of the subcontractor worker to work should doubt arise during task operations. This information is also required from the subcontractor in order for the OMP to clear the subcontractor worker as a hazardous material worker. Subcontractor past radiation exposure history shall be submitted to the Operational Dosimetry Unit of EG&G Idaho (Section 3.5 of Chapter 2 in the Radiological Controls Manual).

It is the policy of the OMP to examine all workers, including subcontractors, when they are injured on the job or there is reason to believe that they have been exposed, over an action level, to toxic substances or physical agents.

Before initiation of any task where a chemical/radiological hazard exists, the appropriate medical facility will be notified of the start of the task, anticipated schedules, and task site locations by the HSO. In addition, the OMP shall be supplied with an inventory of the known hazardous constituents located at the task sites.

In the event of an IH and/or RE documented exposure to a hazardous substance or physical agent over an action level, the worker(s) shall be transported to the nearest medical facility for evaluation. Further medical evaluation will be in accordance with the symptoms, specific hazard involved, exposure level, medical surveillance requirements, current health and safety directives, and sound medical practices.

The following information shall be provided to the OMP:

- Name, job title, work location, supervisor's name, and supervisor's phone number
- Substances/physical agents (e.g., noise) involved

- Date the employee was first exposed to the substance/physical agent on this task
- Monitoring data including locations of samples and dates samples were taken, if exposed over action level
- PPE in use during this task
- Number of days per month PPE has been in use
- How long this employee will be exposed to the substance or physical agent
- Training the employee has received in the use of PPE
- Type of respirator, if any, being used.

5. HAZARD EVALUATION

Personnel may be exposed to a variety of substances and physical agents while working at the task site. Exposures may be a result of contacting materials stored, handled, or disposed; equipment being used; weather conditions or time of day; environmental surroundings; and/or task specific working conditions. The FTL should asterisk all suspected hazardous materials pertinent to the task on the list provided in the task specific addendum. Any additional stress agents should also be listed in the task specific addendum. A job hazard analysis using EG&G Idaho Company Procedure, Number 11.9 shall be used as appropriate to perform portions of the task site hazard evaluation. All personnel working at a task site should be aware of existing hazards.

The following sections provide general information on the types of potential exposures that may be encountered while working at task sites.

5.1 Chemical Agents

Exposure to chemical agents may result when personnel come in contact with gaseous, liquid, or solid materials encountered at the investigation sites. Personnel shall make every effort to avoid direct contact with disposed or hazardous materials. Task operations personnel may be exposed to contamination through inhalation, ingestion, absorption (skin/eye), and injection (puncture wound).

- Inhalation of hazardous materials can occur due to lack or improper use of respiratory equipment, malfunctioning monitoring equipment, presence of undetected chemicals, or chemicals in quantities greater than the respiratory equipment protection limits.

- Digestive system may be affected by hazardous substances when workers do not practice good personal hygiene habits (e.g., washing hands thoroughly after completion of work and before smoking,

eating, drinking, and chewing gum or tobacco). Inhaling or swallowing airborne hazardous substances may also produce adverse effects to the digestive system.

- Skin absorption of solid, liquid, or gaseous hazardous substances can occur through cuts or abrasions. Skin absorption can occur when a worker does not wear proper protective clothing or when a breach of protective clothing has occurred.

- Eye irritation may develop from solid, liquid, gaseous contaminants. This irritation may occur when a worker does not wear proper eye protection or when unwashed hands come in contact with the eyes.

- Hazardous substances may be injected into the body through puncture wounds occurring from contaminated equipment with sharp edges or protrusions.

5.2 Fire and Explosion

Explosions and fires may occur as a result of activities such as moving drums, accidentally mixing incompatible chemicals, introducing an ignition source into an explosive or flammable environment, or refueling equipment. Intense heat, open flame, smoke inhalation, flying objects, and the release of toxic chemicals into the environment can result.

5.3 Oxygen Deficiency

Oxygen deficiency can result from the displacement of oxygen by another gas or the consumption of oxygen by a chemical reaction. Confined spaces or low-lying areas such as pits or trenches are particularly susceptible to oxygen deficiency. The EG&G Idaho Safety Manual, Section 20 Appendix A and

the EG&G Idaho Company Procedures Manual, Number 11.3, should be reviewed by those working in a confined space.

5.4 Radiological Hazards

The potential exists for radiation exposure and radiological contamination to task operations personnel. Contamination is the presence of uncontained radioactive material on any object or surface or in the atmosphere, especially where the presence of radioactive material may be harmful or could be spread if disturbed by an outside agent.

Types of contamination are discussed below.

- Loose contamination is easily spread to adjacent areas and can be ingested or inhaled.
- Fixed contamination is the presence of uncontained radioactive material on surfaces which cannot be easily removed by normal decontamination techniques.
- Airborne contamination is normally in particulate form and is of concern because it can be ingested or inhaled. When inhaled, airborne particulate can deposit in the lungs and diffuse to other parts of the anatomy causing an internal exposure hazard (respiratory protection must be worn when entering an airborne contamination area.)

Contamination may enter the body through

- Absorption
- Injection
- Ingestion
- Inhalation.

Radiation is energy emitted from a source that travels in electromagnetic waves or very small particles at various speeds or energies. Ionizing radiation is energy emitted from an unstable atom in the form of particles (alpha, beta, neutron) and/or electromagnetic wave or photons (gamma and x-ray) which has enough energy to interact with other atoms and change their charge. Personnel may be irradiated without contamination but cannot be contaminated without being irradiated.

5.5 Biological Hazards

Waste from research facilities, garbage, and animal feces may contain disease-causing organisms. If these agents are present, they could infect task operations personnel and be dispersed in the environment by water and wind. It is recommended (not required) that operations personnel be immunized against tetanus bacteria, which live in the soil, to minimize the effects of possible exposure.

Encounters with wildlife may be possible at the task site. Snakes, insects, and other animals can and will bite if disturbed and avoidance is the best solution. Prompt first aid should be performed if this type of injury occurs.

5.6 Industrial Safety Hazards

Numerous unsafe conditions or actions may be encountered. These may include:

- Existing objects and terrain
- Elevated work areas
- Lifting heavy objects
- Moving machinery and falling objects
- Personal protective equipment

- Task related equipment
- Excavation, trenching, and shoring.

Task operations personnel should look for potential hazards and immediately inform the FTL of those hazards so that action can be taken to minimize injury due to an unsafe condition or action.

5.6.1 Existing Objects or Terrain

Existing objects and terrain can present safety hazards such as:

- Holes and ditches
- Precariously positioned objects (e.g., drums or boards that may fall)
- Sharp objects (e.g., nails, metal shards, and broken glass)
- Slippery surfaces
- Overhead power lines
- Steep grades
- Uneven terrain
- Unstable surfaces (e.g., walls that may collapse or flooring that may give way)
- Ladders/stairs.

Additional safety hazards introduced by the task should be listed in the task specific addendum.

5.6.2 Elevated Work Areas

During the course of task activities, personnel may be required to work on elevated equipment. When such work must be performed, the provisions stated in Section 16 of the EG&G Idaho Safety Manual shall be followed. In addition, personnel required to work under these conditions shall be trained on the use of elevated equipment.

5.6.3 Lifting Heavy Objects

Operations personnel may risk injury by lifting heavy objects. All operations personnel should be trained in the proper method of lifting heavy equipment and cautioned against lifting objects that are too heavy. Mechanical and hydraulic assists will be used whenever possible to minimize lifting dangers.

5.6.4 Moving Machinery and Falling Objects

Task operations personnel may be subject to lacerations and contusions (cuts and bruises) when activity involves contact with moving machinery and falling objects. Injury can be minimized by wearing protective clothing, hard hats, steel-toed boots, and using mechanical assists whenever possible. Loose clothing or neck chains for security badges should not be worn and hair should be secured when personnel work around equipment with moving parts or any other potentially hazardous piece of equipment. All moving and rotating machinery must be properly guarded and guarding must remain in place.

5.6.5 Personal Protective Equipment

Wearing PPE may reduce a worker's ability to move freely, see clearly, and hear directions and noise that might indicate a hazard. Also, PPE can increase the risk of heat stress. Personnel must adjust their work activities to accommodate limitations.

5.6.6 Task Related Equipment

Hazardous equipment and/or situations not mentioned above shall be listed in the task specific addendum. The FTL shall make all personnel aware of possible dangers associated with use of hazardous equipment and/or situations.

5.6.7 Excavation, Trenching, and Shoring

Work at hazardous waste sites may involve excavations for purposes of positioning equipment, removal of contaminated soils, removal of underground tanks, or retrieval of containers such as drums, piping systems, or other buried materials. Tasks which involve work in any excavation present serious potential hazards to personnel; personnel protective systems, barricades, signs, and daily inspections are some of the safeguards required for excavation work. For more detail, see the OSHA requirements outlined in 29 CFR 1926, Subpart P - Excavations. In addition, EG&G Idaho Safety Manual Section 20.0, Appendix B, contains additional requirements which may be more restrictive than those of the OSHA standard.

5.7 Electrical Hazards

Overhead power lines, downed electrical wires, and buried cables all pose the danger of shock or electrocution of workers. Electrical equipment may also pose a hazard to workers. Careful observation for overhead electrical hazards will be performed by operating personnel before raising masts on drill rigs or using cranes. Underground utility clearances must be obtained before drilling or excavating operations by contacting Telecommunications (526-1591/526-2512). The EG&G Idaho Safety Manual, Supplement 2.2 "Safe Work Permits (SWPs)/Special Safe Work Permits (SSWPs)," and Section 10, "Electrical Safety," shall be followed for all work performed near overhead electric lines and electrical work.

5.8 Heat Stress

Workers may be required to wear protective clothing that could prevent the body from cooling naturally, thus causing a rise in body temperature. High body temperatures can result in heat fatigue, physical discomfort, and death. The IH must inform the FTL of signs and symptoms of heat stress to preserve safe work conditions at the task site. Work scheduled for summer

months is subject to higher ambient temperatures than in winter. Radiant heat can create a hazard in the summer. EG&G Idaho Company Procedures Manual, Number 11.10 discusses the hazards of heat stress.

5.9 Cold Exposure

Exposure to low temperatures may be a factor if work is done in the evening hours, if winds are high, if unpredictable weather moves in, and in the winter months (e.g., at 50°F, with a 25 mph wind, the equivalent chill temperature is 32°F). EG&G Idaho Company Procedures Manual, Number 11.10 discusses the hazards of cold stress.

5.10 Noise

Task operations personnel may be exposed to high levels of noise generated by heavy equipment and other sources.

5.11 Decontamination

The chemical and radiological decontamination processes for tools, equipment, clothing, and personnel to remove contaminant generated by the task site activities have the potential for spreading contamination and increasing the exposure to personnel if care is not exercised when decontamination activities are taking place. High pressure hot water and steam used in the process can present a hazard if blasts of either agent rebound into the face or onto the body. In addition, airborne contaminants may result from this process. Decontamination procedures shall be followed and appropriate personal protection shall be used during decontamination activities. Good housekeeping measures will be followed, so that decontamination liquids do not present a hazard.

5.12 Work Stress

Hazardous activities that rely on a high degree of personal alertness shall be performed under controlled conditions of job performance as outlined in Section 20 of the EG&G Idaho Safety Manual. The FTL assumes responsibility of good judgment in the assignment of personnel fatigued by excessive hours of work in psychologically and possibly physiologically stressful environments.

6. LEVELS OF PROTECTION AND PERSONAL PROTECTIVE EQUIPMENT

Selection of PPE is based on the recommendations contained in NIOSH, 10/85. Each work location will be evaluated for potentially hazardous contaminants by the SE, IH, and HPT before entry. Due to the types of known contaminants and the likelihood of unknown contaminants being present, several recommended levels of PPE are described in this section. The levels are Level A, Level B, Level C, and Level D. Radiological control levels include Zone I, Zone II, and Zone III. The required level for PPE will depend on the IH and RE task site hazard assessment, physical conditions, and monitoring data. The level of PPE used at the task site shall be specified by the IH and RE. Changes in PPE level shall be documented in the FTL logbook.

Without compromising the protection from chemical and radiological exposure, and considering the comfort of the workers, Level B and Level C clothing may be modified as stated in Chapter 8 of the referenced NIOSH, 10/85. That decision will be made by the IH and HPT and documented by the FTL in the task specific addendum.

6.1 Respiratory Protection

All personnel shall wear only those respirators for which they have been trained and acceptably fit-tested. Respirators shall be used under the recommendation of the IH and HPT. Also, guidelines for respirator use, emergency use, storage, cleaning, and maintenance, as stated in EG&G Idaho Company Procedures Manual, Number 11.1, shall be followed.

Inspection procedure performed before respirators are used:

- Check to ensure that bag containing respirator is intact and that expiration date stamped on bag has not expired.
- Check to make sure respirator is clean.

- Look for breaks or tears in the headband material. Stretch the bands to ensure sufficient elasticity.
- Ensure that all headbands, fasteners, and adjusters are in place and not bent.
- Check the facepiece for dirt, cracks, tears, or holes. Ensure that the rubber is flexible, not stiff.
- Check the shape of the facepiece for possible distortion that may occur if the respirator is not properly stored.
- Check the exhalation valve located near the chin between the cartridge holders by:

  - Unsnapping the cover,
  - Lifting the flexible rubber valve and the valve seat to check for cracks, tears, dirt, and distortion, and,
  - After replacing the cover, ensuring that it spins freely.

- Check both inhalation valves located under the respirator cartridges for the same items listed above.
- Check the cartridge holders to ensure that they are clean, necessary gaskets are in place, threads are not worn, and there are no cracks or other visible signs of damage and ensure that they are the correct type of cartridge required for the job.
- Check cartridges (especially the threaded portions) for dents or other damage.

6.2 Level D Personal Protective Equipment

Personnel working inside the task site and wearing Level D PPE shall wear, as appropriate:

- Safety glasses (see Section 16 of EG&G Idaho Safety Manual)
- Safety shoes as described in Supplement 16.4 of the EG&G Idaho Safety Manual

- Hard hat (see Section 16 of the EG&G Idaho Safety Manual)
- Hearing protection as required in the EG&G Idaho Company Procedures Manual, Number 11.7.

6.3 Level C Personal Protective Equipment

Personnel working inside the task site and wearing Level C PPE shall wear, as appropriate:

- Full-face or half-face air-purifying respirator (with appropriate filters and eye protection) as required by INEL Health Physics and the IH.

NOTE: The use of half-face respirators is not permitted in a radiological environment without authorization of the program/facility manager in consultation with a radiological engineer per EG&G Idaho Company Procedures Manual, Number 11.1.

- Disposable chemical-resistant coveralls
- Anti-c clothing as recommended by RE if radiological hazards exist (see Section 6.6 below)
- Safety shoes as described in Supplement 16.4 of the EG&G Idaho Safety Manual
- Chemically resistant shoe covers
- Hard hat (see Section 16 of the EG&G Idaho Safety Manual)
- Inner chemically resistant gloves
- Outer chemically resistant gloves
- Hearing protection as required in the EG&G Idaho Company Procedures Manual, Number 11.7
- Eye protection as required by SE (see Section 16 of the EG&G Idaho Safety Manual)
- Emergency egress respirator.

6.4 Level B Personal Protective Equipment

Level B is the same as Level C except the respiratory protection is upgraded to air supplied hood or SCBA. Personnel working inside the task site with designated Level B PPEs shall wear, as appropriate:

- Air supplied hood or SCBA
- Emergency egress respirator
- Disposable chemically resistant coveralls
- Anti-c clothing as recommended by the RE if radiological hazards exist (see Section 6.6 below)
- Safety shoes as described in Supplement 16.4 of the EG&G Idaho Safety Manual
- Chemically resistant shoe covers
- Hard hat (see Section 16 of the EG&G Idaho Safety Manual)
- Inner chemically resistant gloves
- Outer chemically resistant gloves
- Hearing protection as required in the EG&G Idaho Company Procedures Manual, Number 11.7.

6.5 Level A Personal Protective Equipment

In rare circumstances, it may be necessary for operating personnel to wear Level A PPE. Level A has the same maximum respiratory protection as Level B; however, the highest available skin and eye protection are required for Level A. All personnel required to wear Level A PPE should include, as appropriate:

- SCBA
- Escape SCBA
- Fully encapsulating, chemically resistant suit
- Additional anti-c clothing as recommended by the RE if radiological hazards exist (see Section 6.6 below)

- Safety shoes as described by Supplement 16.4 of the EG&G Idaho Safety Manual
- Chemically resistant shoe covers (if applicable)
- Hard hat (if applicable)
- Inner chemically resistant gloves
- Hearing protection as required in the EG&G Idaho Company Procedures Manual, Number 11.7.

6.6 Personnel Protection in Radioactively Contaminated Areas

Anti-c clothing shall be worn in contamination control zones. Personal clothing other than underwear and shoes shall not be worn in Zones II and III. Health Physics personnel (HPT and RE) shall define the anti-c requirements for working in areas on the basis of contamination levels determined by surveys and the guidelines below. For entry into Zones II and III, all openings between the coveralls and shoe covers, gloves, and hood shall be taped. Anti-c clothing shall be donned only at or near the contamination control point of the area to be entered. Guidelines for personnel protection in radioactively contaminated areas are contained in the EG&G Idaho Radiological Controls Manual, Chapter 4, Section 3.5.1. The minimum anti-c personal protection for each contamination zone is presented below.

6.6.1 Zone I - Low Level Contamination

The minimum requirements for Zone I anti-c personal protection include:

- One pair of cloth anti-c coveralls (or disposable)
  Note: This requirement may be deleted by the HPT for walk-through entries or health physics surveys.
- One pair of shoe covers
- One pair of latex gloves.

6.6.2 Zone II - Moderate Level Contamination

The minimum requirements for Zone II anti-c personal protection include:

- One pair yellow cloth anti-c coveralls (or disposable)
- One yellow cloth hood (or disposable)
- Three pairs of shoe covers (two pairs must be vinyl)
- One pair latex gloves.

6.6.3 Zone III - High Level Contamination

The minimum requirements for Zone III anti-c personal protection include:

- One pair yellow cloth anti-c coveralls and hood
- One pair disposable anti-c coveralls (or plastic anti-c suit) with disposable hood
- Three pairs of shoe covers (two pairs must be vinyl)
- Two pairs of latex gloves
- Respiratory protection commensurate with contamination levels.

7. SAFE WORK PRACTICES

An SWP or SSWP may be required for a task as described in Section 2.4 of the EG&G Idaho Safety Manual. That section along with Supplement 2.2 describe the types of work that require an SWP or SSWP.

Several factors may affect the safe working environment in the field (e.g., inclement weather, confined work space, extended working schedules, work in heavy PPE, temperature, and work done under artificial illumination). These factors can compromise the work performance of task operations personnel. The FTL is responsible for communicating with task operations personnel to ensure safe and efficient work conditions.

7.1 Working in Confined Spaces

If work is to be performed in a confined space, the FTL will ensure the area is safe for entry, work, and egress in accordance with EG&G Idaho Company Procedures Manual, Number 11.3. If appropriate, specific task site instructions for working in confined spaces shall be presented in the task specific addendum. Task operations personnel shall not enter the confined space until safety personnel and the FTL can ensure it to be safe and the SWP is approved.

7.2 Extended Working Schedules

If work schedules must be extended, Section 20 in the EG&G Idaho Safety Manual offers the guidelines and managerial approval needed for personnel working more than a 48-hour week. The FTL is responsible for the safety of task operations personnel; however, when work weeks are in excess of 48 hours, the FTL must realize that physiological and psychological stresses reduce the safety and efficiency of the field operations. Ultimate responsibility for safety of operations belongs to the FTL.

7.3 Working in Heavy PPE

Work performed in heavy PPE creates additional stresses which severely limit the ability of operations personnel to work long shifts. The FTL should be aware of such limitations and adjust schedules accordingly. The IH and HPT will advise the FTL on this issue.

7.4 Working with Artificial Illumination

If hot and/or windy conditions exist during the regular work shift, schedules may be changed to perform operations at night. Artificial illumination, although a necessity, can create an environment of reduced visibility for the workers. Task operations personnel must be alert and cautious as they maneuver around work areas.

7.5 Buddy System

The buddy system is an effective way to ensure each worker is monitored as to his mental and physical well being during the course of a work day. By using the buddy system, task operations personnel can reduce the chance of being ill or injured and not be noticed. This is particularly crucial for workers in the exclusion zone (Section 8.1 of this H&S Plan). The FTL will pair workers to regularly check on one another during the day's activities. Each member of the pair will observe the other for alertness, motor functions, and coherence.

7.6 Handling Drums and Containers

Drums and containers handled during the task shall be addressed in the task specific addendum. Each drum or container shall meet the appropriate DOT, OSHA, and/or EPA regulations for the wastes they contain. The addendum shall address inspection, labeling, handling operations, waste characterization, spill containment, and transportation. EG&G Idaho Company

Procedures Manual, Numbers 8.1, 8.2, and 8.3 address many of the above items. In addition, if the work plan associated with the task addresses the handling and disposing of waste, the work plan shall be referenced in the addendum.

7.7 ALARA Goals

The as low as reasonable achievable (ALARA) policy objective is to reduce personnel and environmental radiation exposures and doses to the lowest levels in keeping with good operating practices. The ALARA program establishes annual radiation dosage goals and management commitments to assist in meeting these goals.

Personnel working at the task site must strive to keep his or her radiation exposure ALARA through the following practices:

- Adhere to all written radiological requirements and verbal guidance
- Be aware of personal radiation exposure history
- Work within ALARA guidelines and make suggestions as needed
- Minimize the production of all radiological waste
- Minimize personal radiation exposure by these basic protection techniques:

    - Time - exposure is minimized as time is minimized
    - Distance - maintain a maximum distance from radiation source
    - Shielding - use any solid material (e.g., lead, steel, concrete) as a shield (Exposure amounts will vary depending on thickness and type of material.)
    - Limits - radiation exposure limits are contained in the EG&G Idaho Radiological Controls Manual, Chapter 2, Section 3.2

- Adhere to general safe work practices discussed in Section 7.9 of this plan.

7.8 Radioactive Spill Control

Contamination in uncontrolled areas is designated as a "spill"; if a spill is noticed, task operations personnel shall initiate the SWIMS approach:

- Stop the spill
- Warn area personnel and notify Health Physics
- Isolate the area
- Minimize exposure to the spill
- Secure any ventilation paths and Health Physics surveys the extent of the spill.

Radioactive spill response is discussed in greater detail in the EG&G Idaho Radiological Controls Manual, Chapter 4, Section 3.8.2.

7.9 General Safe Work Practices

The following are general safe work practices to be followed on each task (if work practices vary from those described below, the FTL must record changes in the task specific addendum):

- Contact lenses shall not be worn in company designated eye-hazard areas unless they are essential to correct a vision defect not correctable by prescription safety glasses. Additional restrictions apply as per the EG&G Idaho Safety Manual, Section 16, paragraph 3.7.

- Eating, drinking, chewing gum or tobacco, smoking, and any other practice that increases the probability of hand-to-mouth transfer and ingestion of material are prohibited within the work/radiation zones. Approved eating areas shall be established or are designated at each Area facility.

- Do not perform work where contaminated substances may be present with an open wound. If a wound is received, report to the HPT and/or IH for further direction.

- Avoid contact with potentially contaminated substances. Do not walk through puddles, pools, mud, etc. Avoid kneeling, leaning, or sitting on equipment or the ground.

- Task operations personnel should watch for dangerous situations (the presence of strong, irritating, and/or nauseating odors, high airborne concentrations of dust, breached drums, etc.). Personnel should report all potentially dangerous situations to the FTL.

- Prevent releases of oil or hazardous materials used in task operations to the extent possible. If spillage occurs, contain it; report it to the facility representative, where applicable; and immediately clean it up in accordance with the Emergency Preparedness Procedures for the Area. Guidelines in Appendix III of the EG&G Idaho Company Procedures Manual, Number 11.6 for spill cleanup may be useful.

- Prevent splashing of contaminated materials during decontamination.

- Keep all potential ignition sources at least 50 ft from an explosive or flammable environment and use non-sparking, explosion-proof equipment.

- Task operations personnel will familiarize themselves with the physical characteristics of the task site including but not limited to:

  - Wind direction
  - Accessibility to fellow workers, equipment, and vehicles

- Communications at and near the task site
- Exclusion zones (areas of known or suspected contamination)
- Site access (both Area and Task)
- Nearest water sources
- Warning devices
- Nearest emergency assistance.

- At all times, a worker in the exclusion zone shall be in line-of-sight contact with his partner.

- Observe your coworker. Look for signs of exhaustion, heat or cold stress, or exposure to harmful vapors. Ask regularly if he/she is okay. Talk to your partner.

- All wastes generated during the task site investigation shall be managed in accordance with the EG&G Idaho Safety Manual, Section 15.

- Adhere to strict personal hygiene practices such as washing face, neck, and hands before eating, drinking, smoking, or using the restroom. Keep hands away from mouth and eyes when working in an exclusion zone or after handling samples or sample containers. A complete shower may be required at the end of a work shift (IH or HPT discretion).

- Proceed directly to a survey station upon leaving a radiological contamination zone. Care should be taken not to touch the face, mouth, and eyes before a survey has been performed.

8. WORK/RADIATION ZONES, SITE ENTRY, AND SECURITY

Based on the expected levels of contamination and work activity anticipated by each task, several work/radiation zones may be established for the task site. If it is determined that specific zones must be established for a particular task, then entry shall be controlled. Unnecessary personnel shall be excluded. Visitors must (a) notify the FTL in advance of the visit, (b) obtain the required training as specified in Section 3 of this H&S Plan, and (c) have business at the task site to obtain access.

Figure 8-1 provides an example of an approved work site and its established work zones as recommended by NIOSH, 10/85. If work zones are deemed necessary by the FTL upon the advice of the HPT, SE, and/or IH, each project's established work zones should be documented in the task specific addendum. Several work zones required for Levels A, B, C, and D work activities are:

- Exclusion zone
- Contamination area
- Contamination reduction corridor
- Contamination reduction zone
- Support area.

Radiological control zones will be established or incorporated into the work zones as required by the RE. Task site areas with radiological contamination in excess of the limits established in Chapter 4 of the EG&G Idaho Radiological Controls Manual shall be posted or labeled as specified in that chapter of the manual.

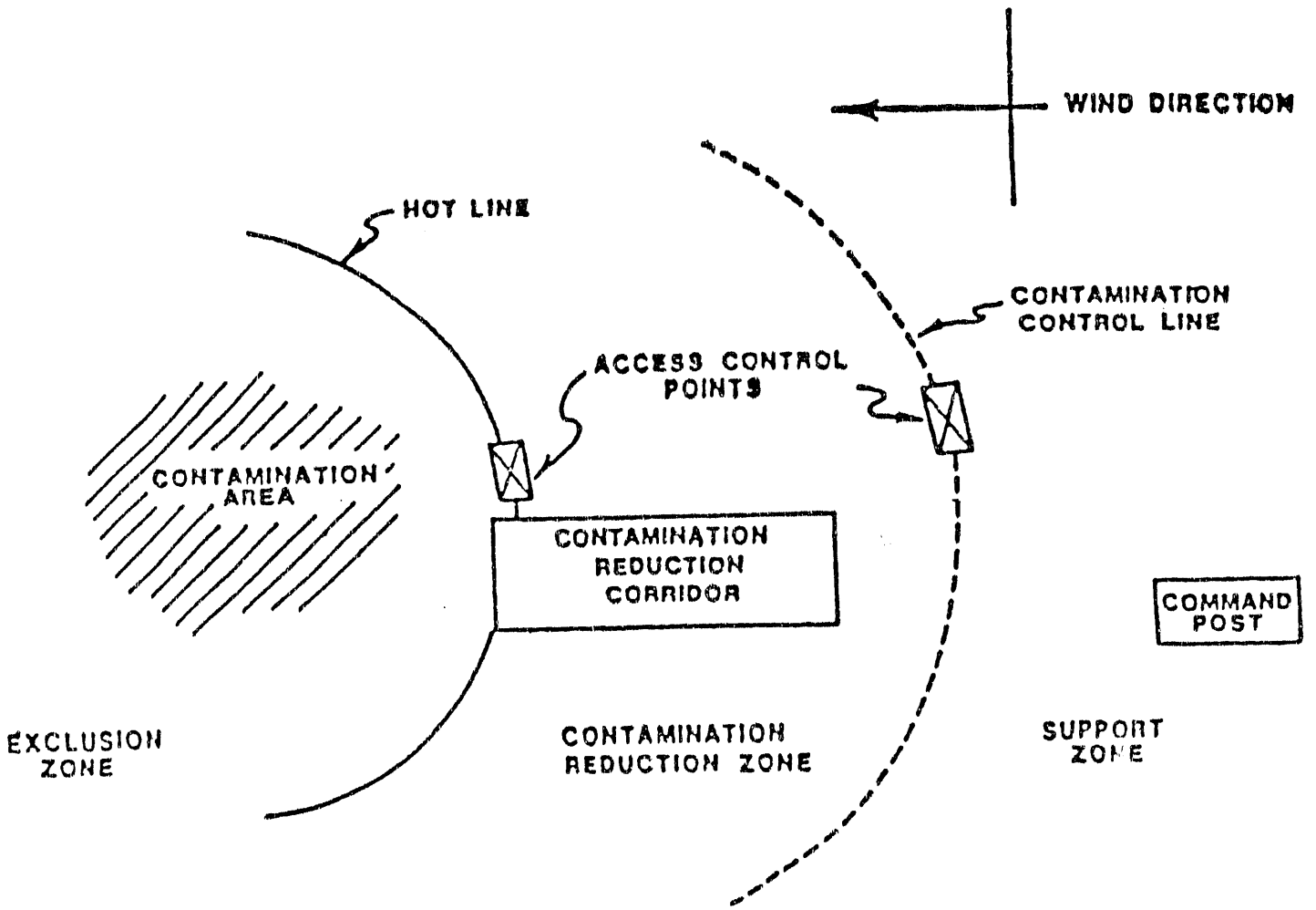

Figure 8-1. Diagram of typical hazardous material task site as recommended by NIOSH, 10/85.

8.1 Work Zones

8.1.1 Exclusion Zone

The exclusion zone includes the immediate work area around the contamination area. The minimum number of personnel required to safely perform the required operations will be allowed into the exclusion zone. The cordon around the exclusion zone is called the "Hot Line."

8.1.2 Contamination Area

The contamination area is the immediate area inside the exclusion zone where investigation activities are taking place. In this area, operations personnel may be subject to the hazards listed in Section 5 of this H&S Plan.

8.1.3 Contamination Reduction Corridor

The contamination reduction corridor is a transition area between the exclusion zone and the support zone. This area will serve as a decontamination area for equipment and a PPE removal area for task operations personnel. In addition, this area may contain emergency response equipment, equipment resupply, and a worker temporary rest area. Due to potential contamination, sample packaging and preparation equipment should not be stored here, but rather, in a contamination free area.

8.1.4 Contamination Reduction Zone

The contamination reduction zone is an area that surrounds the exclusion zone and contamination reduction corridor. This area may consist of several work stations (i.e., sampling, handling, and record keeping) as well as staging areas for equipment. The cordon around the contamination reduction zone is called the "contamination control line."

8.1.5 Support Area

The support area is the area outside the contamination reduction zone. It may contain the equipment trailer, command post, vehicle parking, equipment staging, or any support activity related to the task at hand. All personnel not trained in hazardous material work and visitors are restricted to this area.

8.2 Radiological Control Zones

External radiation control areas and radioactive contamination zones are identified and posted as radiological hazards through the use of barriers and postings. Barriers are used to help confine radiological hazards to a specific area. Yellow and magenta ribbons, ropes, tags, and signs are used to keep unauthorized personnel out of the area. External radiation control areas and radioactive contamination zones shall be posted in accordance with the EG&G Idaho Company Procedures Manual, Number 10.10 and the EG&G Radiological Controls Manual, Chapters 2 and 4. Task specific radiation control areas and contamination zones shall be determined by the RE and HPT and documented in the addendum.

8.2.1 External Radiation Exposure Control

External exposure control is accomplished by identifying areas containing sources of radiation and controlling personnel access into these areas. Section 2 of the EG&G Idaho Radiological Controls Manual discusses external radiation exposure control requirements. These areas shall be posted in accordance with the provisions stated above.

External exposure control is achieved through the following:

a. Controlled Area - Any area where radioactive materials or elevated radiation fields may be present shall be clearly and conspicuously posted as a controlled area.

b. Radiation Area - Any area within a controlled area where an individual can receive a dose equivalent greater than 5 mrem but less that 100 mrem in 1 hr at 30 cm from the radiation source.

c. High Radiation Area - Any area within a controlled area where an individual can receive a dose equivalent of 100 mrem or greater but less than 5 rem in 1 hr at 30 cm from the radiation source.

d. Very High Radiation Area - Any area within a controlled area where an individual can receive a dose of 5 rem or greater in 1 hr at 30 cm from the radiation source. Access to these areas shall be maintained, locked, or physically guarded.

8.2.2 Radioactive Contamination Control

Radioactive contamination controls limit the amount of radioactive surface contamination which individuals are exposed to minimize possible inhalation, ingestion, or absorption of radioactive material; to minimize the potential for release of radioactivity to the environment; and to prevent external contamination of personnel. Contamination limits are set primarily to define "detectability" or the lower limit of detection under ideal conditions. The fundamental philosophy is that no "detectable" contamination will be released to uncontrolled areas. The limits are not based on hazards to personnel but to maintain a high degree of control, restricting radioactive contaminants by engineered barriers. Chapter 4 of the EG&G Idaho Radiological Controls Manual discusses radioactive contamination control in more detail.

Contamination is classified as Zone I, II, or III based on contamination levels as follows:

- Zone I Limits of Contamination
  - 200 to 5000 dpm/100 cm^2 beta-gamma
    20 to 50 dpm/100 cm^2 alpha
- Zone II Limits of Contamination
  - >5000 to 20,000 dpm/100 cm^2 beta-gamma
    >50 to 250 dpm/100 cm^2 alpha
- Zone III Limits of Contamination
  - >20,000 dpm/100 cm^2 beta-gamma
    >250 dpm/100 cm^2 alpha.

9. ENVIRONMENTAL AND PERSONNEL MONITORING

Employee exposure to contaminants and physical hazards will be monitored during all task site activities using an appropriate combination of techniques. The FTL in conjunction with the appropriate personnel (e.g., IH, HSO, RE, SE, and HPT) for each task shall list any monitoring equipment requirements for specific potential hazards in the task specific addendum. An example of items that may be monitored is:

1. Organic vapor using an organic vapor monitor

2. Combustible gas using a combustible gas indicator

3. Heat or cold stress using field measurements and observations and, if necessary, body temperature measurements

4. Radiation and contamination surveys using radiological monitoring equipment

5. Personal exposure to organic vapors, particulate contamination (heavy metals) using personal monitoring pumps and appropriate filter collection media (active sampling)

6. Personal exposure to radiation using thermoluminesent dosimeters (TLDs) and direct reading dosimeters (DRDs)

7. Mercury vapors using a mercury vapor detector

8. Noise levels using a sound level meter and/or noise dosimeter

9. Loose radiological contamination using smears or large area wipes.

9.1 Chemical Exposure Monitoring

Selective monitoring of high-risk task operations personnel at the chest or face level for organic vapors may be recommended by the IH. The monitoring devices used, frequency of monitoring, designated high-risk jobs to be monitored, and action levels for hazardous contaminants shall be discussed in the task specific addendum.

Equipment for monitoring organic vapors at the task site shall be identified by the IH. The equipment, monitoring schedule, and calibration methods shall be discussed in the task specific addendum. The monitoring activities shall be initially based on the job hazard analysis results.

9.2 Combustible Gas Monitoring

If deemed necessary by the SE, the task site will be monitored for combustible gases at time intervals recommended by the SE. Elevated readings from the organic vapor detector might indicate the presence of combustible gases. The SE and IH will advise the FTL on circumstances when work at the task site will be suspended and the course of corrective action, and ensure the task site is safe before work continues. Action levels for combustible gases shall be documented in the task specific addendum.

9.3 Radiological Monitoring

The RE and HPT will be responsible for radiological monitoring in accordance with the EG&G Idaho Radiological Controls Manual, Chapters 2 and 4; and Section 10 of the EG&G Idaho Company Procedures Manual.

9.3.1 External Radiation Exposure Control

Personnel exposures are monitored by TLDs and DRDs. Personnel are responsible for properly wearing the specified dosimetry while in

radiologically controlled areas. If the TLD (or other dosimetry) is lost, task operations personnel shall immediately notify the FTL and HPT. TLDs are supplied and processed by the Operational Dosimetry Unit.

Radiation surveys shall be performed by the HPT to determine the extent and magnitude of radiation levels and to enable posting of radiation areas. Surveys shall be performed in accordance with the EG&G Idaho Radiological Controls Manual, Chapter 2, Section 3.8.

9.3.2 Radioactive Contamination Control

All surfaces or areas with contamination levels in excess of those levels stated in Section 8.2 of this plan shall be monitored and controlled to prevent the spread of contamination. Contamination surveys shall be performed by the HPT in accordance with the EG&G Idaho Radiological Controls Manual, Chapter 4, Section 3.3.

All personnel shall obtain a whole body survey after exiting a contamination zone; the whole body survey must be done for two to three minutes. The following portable instruments are most commonly used to detect personnel contamination: (a) Ludlum 2a, (b) Eberline RM-14, and (c) Ludlum 177 with pancake probe (frisker), for beta-gamma contamination; and (d) Ludlum Model 61 and (e) Eberline Pac-4s, for alpha contamination. In addition to portable field instruments, the following personnel contamination monitors may be used: (a) large area detectors, (b) portal monitors, (c) personnel contamination monitors, and (d) hand and foot monitors.

9.4 Heat and Cold Stress Control and Monitoring

The FTL will set work/rest schedules as recommended by the IH. Depending upon the ambient weather conditions or work conditions and physical response of task operations personnel, the IH will suggest adjustments of the work/rest cycle to the FTL. The FTL, HSO, and/or IH will ensure that

operations personnel follow established work and break schedules, adequately replace body fluids, and keep body temperatures in a normal range in accordance with the EG&G Idaho Company Procedures Manual, Number 11.10.

Workers will be interviewed by the IH and/or HSO periodically to ensure that the controls are effective and excessive heat exposure is not occurring. Workers will be encouraged to monitor their body signs and take a break if symptoms of heat stress occur.

Task operations personnel shall be aware of the following signs and symptoms of heat stress:

- CONFUSION
- FAINTING
- SLURRED SPEECH
- Clammy skin
- Dizziness
- Fatigue
- Nausea
- Profuse sweating
- Skin color change
- Vision problems.

Task operations personnel who exhibit any of these symptoms will be immediately removed from the task site. An individual who shows any of the symptoms that are capitalized and underlined, or any other evidence of change in level of consciousness, will be transported to an OMP facility for medical evaluation. Mental confusion and decreased level of consciousness must always be considered an emergency requiring medical evaluation and treatment. Transportation to a medical facility or use of an ambulance should be considered normal procedure in this situation. Individuals showing any of the remaining symptoms listed will be provided cool water and allowed to rest. On any occasion when the FTL, worker experiencing the heat stress symptoms, or IH

believes the heat stress is severe or desires medical evaluation, the employee may be brought to an OMP medical facility.

Rest breaks shall include the following preventive measures:

- Drink adequate liquids
- Rest in a cool, shaded area
- Remove protective clothing to allow evaporative cooling
- Do not perform other work during the break.

If personnel are wearing semipermeable or impermeable PPE, the work/rest schedule may be adjusted and monitoring of individual personnel temperatures may be required by the IH. If ambient temperatures are considered excessive by the IH and/or symptoms outlined above exhibited, workers must be monitored for heat stress and recovery. This includes measuring heart rates and temperatures. Temperatures can be obtained using disposable thermometers. The HSO will ensure that sufficient liquids (electrolyte replacement fluids such as Gatorade) are provided and that they are consumed only in the designated and approved eating/drinking area.

Adequate protective clothing as required by IH should be worn to protect against the cold. Extra care must be exercised while working in this environment. Workers should observe each others facial extremities (ears and nose) for signs of frostbite (whitening of the skin surface). Decreased mental coherence and body movements are signs of hypothermia. Individuals with suspected hypothermia or other significant cold injury (e.g., frostbite) will be taken to an OMP medical facility.

Finally, the FTL or IH will refer a worker to the OMP for medical evaluation whenever there is doubt concerning the medical ability of an employee to continue in the assigned task.

9.5 Noise-Level Monitoring

If high noise levels are encountered by operations personnel at the task site, worker exposure will be assessed by the IH. A hearing conservation program must be developed by the IH when the sound levels exceed an 8-hour time weighted average of 85 dBA. Noise level monitoring, PPE requirements, and audiometric tests shall be outlined in the hearing conservation program for the task or employee. Requirements shall be imposed by the PM based on the advice of the IH and the requirements stated in the EG&G Company Procedures Manual, Number 11.7 and the EG&G Industrial Hygiene Manual, Section 26.

9.6 Physical Hazard Control and Monitoring

The FTL will have the primary responsibility for ensuring the task site is maintained in a safe condition by requiring maintenance of barriers and signs, correction of unsafe conditions, and cleaning of debris and trash. The appropriate personnel (e.g., IH, SE, and HPT) will inspect and recommend changes in work habits to the FTL.

Individuals working on a task have a specific responsibility to use safe work techniques, report unsafe working conditions, and exercise good personal hygiene and housekeeping habits throughout the course of their job.

9.7 Record Keeping Requirements

ERP is required to maintain the following information in the ARDC program file in accordance with 29 CFR 1910.120:

- Copies of the Management Plan for the Environmental Restoration Program, Task Specific H&S Plan, QPP, QAPjP, and work plan.

In addition, ERP shall track the following information for each ERP hazardous material worker through the Training and Emergency Action Unit of the Waste Management Operations Support Group:

- Proof of training in health and safety hazard recognition, radiation worker training, respirator training, and any other training specific to the employee

- Required training and updates

- Copy of the signed Health and Safety Certification Form.

The IH is required to maintain a logbook of air monitoring data, personal sampling data, times of sampling intervals, calibration of instruments, and identity of personnel wearing the monitoring equipment. Instrumentation detection ranges and uncertainties should also be recorded in the IH logbook. The HPT is required to keep a logbook of all radiological monitoring, daily operational activities, and instrument calibrations. All project records and logbooks, except HPT logbooks, shall be forwarded to ARDC within 30 days after completion of the task.

10. DECONTAMINATION PROCEDURES

Decontamination procedures for personnel and equipment are necessary to control contamination and to protect operations personnel. Both chemical and radiological decontamination are discussed in this section. However, combined chemical and radiation decontamination procedures are not discussed here and must be developed by the IH and RE if required for a specific task. Decontamination procedures shall be presented in the task specific addendum. These procedures can be amended upon recommendations by the IH, RE and/or HPT. When chemically hazardous material decontamination or radiological decontamination is required, the following procedures are suggested.

10.1 Modified Level A and B Decontamination Procedures

If Level A or B PPE is required, then two decontamination stations will be used at the task site--one at the hotline between the exclusion zone and the contamination reduction corridor and one at the contamination control line, which is the personnel access point to the support zone from the contamination reduction corridor. Decontamination Station A supports personnel and equipment exiting the exclusion zone. Figure 10-1 lists the recommended decontamination procedures. Steps 1 through 8 shall be completed at Station A. Coveralls shall be removed at Station B.

10.2 Modified Level C Decontamination Procedures

Decontamination Station B should be located at the personnel access to the contamination reduction corridor. It is to be used by personnel working in the contamination reduction corridor. Figure 10-2 lists the modified Level C decontamination procedures. If Tyveks are worn (if recommended by the IH), they are decontaminated and removed at Station A.

1.	Remove equipment	EXCLUSION ZONE
2.	Wash and rinse boot covers and gloves	
3.	Remove tape	
4.	Remove boot covers, outer gloves, and hood	
5.	Disconnect air hose and tape end	
		HOT LINE (STATION A)
6.	Wash and rinse suit and boots	
7.	Remove suit	CONTAMINATION REDUCTION CORRIDOR
8.	Wash, rinse, and remove inner gloves	
9.	Remove coveralls	
		CONTAMINATION CONTROL LINE (STATION B)
10.	Field wash/shower	
11.	Put on personal clothing	SUPPORT ZONE

Figure 10-1. Recommended modified Level A and B PPE hazardous chemical decontamination steps.

1.	Remove equipment	CONTAMINATION REDUCTION CORRIDOR
2.	Wash and rinse boot covers and gloves (if worn)	
3.	Remove tape	
4.	Remove boot covers and outer gloves	
5.	Wash, rinse, and remove boots and suit (if worn)	
6.	Remove and drop respirator	
7.	Wash, rinse, and remove inner gloves	
8.	Remove coveralls	
9.	Field wash/shower	CONTAMINATION CONTROL LINE (STATION B)
10.	Put on personal clothing	SUPPORT ZONE

Figure 10-2. Recommended modified Level C PPE hazardous chemical decontamination steps.

At the end of the work day, a full-body shower may be required by the IH or HPT.

10.3 Radiological Decontamination

Radiological decontamination shall be done under the direct supervision of Health Physics (RE and/or HPT) and in accordance with the EG&G Idaho Company Procedures Manual, Number 10.4. Figures 10-3, 10-4, and 10-5 provide the anti-c removal steps for the three contamination control zone designations. Any personnel and personal property contamination may be removed with tape, vacuuming (vacuum must be equipped with a high efficiency particulate air filter), washing with soap and water, or by mechanical means (grinding, etc.).

10.4 Equipment Decontamination and Disposal of Contaminated Materials

Decontamination procedures for equipment shall be recorded or referenced in the task specific addendum. All waste generated by performing decontamination must be disposed in accordance with Section 15 of the EG&G Safety Manual for hazardous nonradioactive waste and radioactive mixed waste. Radioactive waste shall be handled in accordance with the EG&G Idaho Radiological Controls Manual, Chapter 6. Disposable clothing, tools, buckets, brushes, and other contaminated equipment shall be secured and disposed as stated in the task specific addendum. Unused contaminated equipment that can be used at a later time shall be placed in plastic bags and stored at the task site. Decontamination of monitoring equipment should also be addressed.

Radioactive waste shall be handled in accordance with the EG&G Idaho Radiological Controls Manual, Chapter 6. Decontamination operations for equipment and areas shall be performed in accordance with approved procedures.

Zone I Removal Barrier

1. Remove outer shoe covers
2. Remove gloves
3. Remove coveralls
4. Remove shoe covers (during the process of stepping through barrier)

EGRESS POINT

5. Remove cloth glove liners

Figure 10-3. Anti-c removal steps for radiological control Zone I.

Zone II Removal Steps

1. Remove outer shoe covers
2. Remove latex gloves
3. Remove hood, coveralls, and shoe covers (remove shoe covers during process of stepping through barrier)

EGRESS POINT

4. Remove cloth glove liners

Figure 10-4. Anti-c removal steps for radiological control Zone II.

Zone III Removal Barrier

1. Remove outer shoe covers
2. Remove latex gloves
3. Remove disposable hood, coveralls, and shoe covers (remove shoe covers during process of stepping through barrier)

EGRESS POINT A

4. Pull inner hood back and remove respirator
5. Remove inner latex gloves
6. Remove cloth hood, coveralls, and shoe covers (remove shoe covers during process of stepping through barrier)

EGRESS POINT B

7. Remove cloth glove liners

Figure 10-5. Anti-c removal steps for radiological control Zone III.

10.5 Decontamination During Medical Emergencies

If a person is injured or becomes ill and lifesaving care is required, the situation will be evaluated by the appropriate personnel (e.g., first aid personnel) on a case-by-case basis. Emergency care will be initiated in accordance with the emergency preparedness procedure for the facility at which the task is being performed. Medical care necessary to save life or limb is not delayed for decontamination. In such cases decontamination may be performed at the medical facility. The IH and/or HPT will accompany the employee to the medical facility and relay information requested by medical personnel.

11. EMERGENCY PROCEDURES, EQUIPMENT, AND INFORMATION

Work at hazardous waste sites makes emergencies a continuous possibility, no matter how infrequently emergencies may occur. Emergencies happen quickly, unexpectedly, and require immediate response. The reporting requirements of Section 3 of the EG&G Idaho Safety Manual shall be followed by personnel at the task site. Locations and telephone numbers of emergency personnel and facilities will be posted at places specified in the task specific addendum. The appropriate emergency facilities will be notified by telephone at the beginning of the task to inform personnel at the facilities that work has begun at the task site. The following sections describe the procedures used during emergency situations; equipment that will be available for emergency situations; and agencies, facilities, and personnel who must be notified in case of emergency.

11.1 Emergency Procedures

The following procedures will be used if an emergency arises:

- FTL will be notified of accidents or conditions that have the potential for adversely affecting or threatening personnel safety, property, or environment. The FTL is responsible for ensuring that the EG&G Idaho Safety Manual and the emergency action procedure for the facility are followed in the event of an accident or unusual condition.

- All safety related occurrences will be recorded in a field logbook and reported as indicated in Section 3 of the EG&G Idaho Safety Manual.

11.1.1 Personnel Occupational Injury or Illness in the Exclusion Zone

In the event of an occupational injury or illness in the exclusion zone, an assessment of the situation shall be made by the FTL using the advice of appropriate personnel (e.g., IH, SE, personnel trained in first aid). If the situation is deemed reportable as described in Section 3 of the EG&G Idaho Safety Manual, the FTL is responsible for initiating reporting procedures. In addition, task personnel shall act in accordance with the emergency preparedness procedures for the facility at which the task is being performed. In the event that the task site is shut down due to an injury, task operations personnel shall not reenter the exclusion zone until the cause of the injury or illness is identified and corrective action implemented. Decontamination shall be performed in accordance with the above mentioned emergency procedures and with recommendations made by the IH, HPT, and/or first aid personnel.

11.1.2 Personnel Occupational Injury or Illness in the Support Zone

If an occupational injury or illness occurs in the support zone, the same procedures as described in Section 11.1.1 shall be followed. If the FTL determines the cause of the occupational injury or illness and the absence of the injured or ill party does not affect the performance of other personnel, task operations will continue.

11.1.3 Transportation and Followup of Injury

An injured worker transported to a medical facility will be accompanied by at least one worker (preferably the IH and/or HPT) to inform medical personnel of the level of decontamination performed before leaving the task site and provide specific details about the illness or injury.

11.1.4 Fire/Explosion

Before initiating task activities, brush and grass will be cleared from the task site to eliminate the risk of fire. The EG&G Idaho Safety Manual, Section 11 and any applicable facility emergency preparedness procedures shall be reviewed.

In the event of a fire or explosion, all personnel not essential to controlling the situation will be evacuated from the task site, and fire and/or explosive experts will be notified. In addition, Section 11 of the EG&G Idaho Safety Manual and applicable emergency action procedures for the facility at which the task is being performed shall be followed.

11.1.5 Personal Protective Equipment Failure

If any task site worker experiences a failure or alteration of PPE, that person and his workmate shall immediately leave the exclusion zone. The HPT and IH will assess the situation and determine if exposure to hazardous substance or radiological uptake has occurred. Reentry will not be permitted until the equipment has been repaired or replaced.

11.1.6 Other Equipment Failure or Hazardous Material Spill

If task site equipment fails to operate properly, the FTL will be notified and will determine the effect of the failure on continuing operations. If the failure affects the safety of personnel or prevents completion of the tasks described in the SAP or other work plan, operations personnel shall leave the task site until the situation is evaluated and appropriate actions are taken.

If hazardous or potentially hazardous material is spilled, refer to the emergency preparedness procedure for the Area in which the task is being performed and report the spill to Area personnel as directed. Spillage of

petroleum products, decontamination solutions, calibration material, equipment fuels, and other liquids containing hazardous materials must be assessed.

11.1.7 Hand Signals

Hand signals shall be used if an emergency situation arises and communication becomes impossible or unsafe. The following hand signals will be used in an emergency:

- Hand gripping throat - signals that the person is out of air or cannot breathe
- Grip partner's wrist or both hands around waist - means leave area immediately
- Hands on top of head - signals that assistance is needed
- Thumbs up - okay, I am all right, I understand
- Thumbs down - no, I am not all right, I do not understand.

11.1.8 Emergency Escape

In cases of life-threatening emergencies such as fire or explosion, personnel should leave the vicinity using the shortest possible route without regard for decontamination at that time and move upwind of the affected area. When the situation has stabilized, personnel will take necessary steps to decontaminate themselves, equipment, and other affected areas.

11.1.9 Task Operations Shutdown

Task operations may be suspended for several reasons as indicated below. However, the reasons for operations shutdown are directly related to the

degree of hazard each task possesses. Specific reasons for suspending task operations should be listed in the task specific addendum. Examples include excessive vapor/gas concentrations, radiological hazards, uncovering waste, inclement weather, etc.

- If a combustible gas indication >10% of the lower explosive limit (LEL) occurs indicating a buildup of explosive vapors, work shall stop. Evaluation of the situation will be made and a course of action determined by the FTL in conjunction with the IH and/or SE.

- When significant radiological hazards are identified by an HPT at the sampling site.

- When unexpected hazardous material is uncovered or found in soil samples, even when the appearance of such material may not be associated with a rise in detected contamination levels.

- In addition, drilling, sampling, instrumentation, and other weather sensitive activities will stop during consistent high winds (i.e., >25 mph), electrical storms, or other inclement weather that may affect the work.

11.1.10 Task Site Reentry

In all situations, when a task site emergency results in evacuation of the task site, personnel shall not reenter until authorized to do so by the FTL. The FTL will ensure that:

1. The hazards have been reassessed by the HSO, IH, SE, and/or the RE.

2. The conditions resulting in the emergency have been corrected.

3. The task specific H&S Plan, SAP, Operational Safety Requirements/Safety Assessments, Standard Operating Procedures (SOPs), DOPs, and the Facility Emergency Action Plan have been reviewed as appropriate.

4. Site personnel have been briefed on any changes in the ERP task specific H&S Plan.

Reentry into an evacuated zone to monitor or collect air samples requires the more restrictive of Level C PPE or the level used by those individuals who evacuated the task site. The IH may upgrade to Level B or A if deemed necessary.

11.2 Warning Devices

Warning lights and/or audible alarms shall be installed in areas where needed to warn personnel against remaining in or entering a hazardous area. An explanatory sign or tag shall be posted immediately adjacent to a warning device to describe the hazardous condition and indicate the action to be taken. Table 12.1 in Section 12 or the EG&G Idaho Safety Manual lists various audible warning devices, their meanings, and the required personnel action. Specific warning devices for the task shall be listed in the task specific addendum. Warning devices for radiological hazards (e.g., remote air monitors) shall also be listed.

11.3 Emergency Equipment

The following emergency equipment shall be available at the task site during field operations as appropriate. (A complete emergency equipment list shall be provided in the task specific addendum.)

Fire Extinguishers: Because of the potential threat of fire at hazardous waste sites, at least one 20-lb (minimum) ABC fire extinguisher will be

readily available and at hand throughout the task activities. Additional fire extinguishers may be necessary. This should be indicated in the task specific addendum.

SCBA: Two SCBAs will be available for emergencies such as reentering a contaminated zone to retrieve injured personnel.

First Aid Kits: An industrial first aid kit with sufficient supplies for five people shall be kept in the support zone. The OMP will advise on the selection of first aid supplies to be included at each task site. The HSO will be responsible for maintaining the proper level of first aid supplies in the task site first aid kit.

Eye Wash: Portable eyewash fountains with sufficient potable water for flushing will be readily available for the duration of the task. The location of the eyewash will be determined by the IH.

Communications: Emergency telephone numbers shall be included in the task specific addendum and posted for all operations personnel. Emergency communication shall be discussed in the safety training prior to initiation of site investigation activities. A two-way radio or telephone with capability to contact emergency personnel shall be located on each task site.

Personal Hygiene: A sufficient supply of clean water, hand soap, and towels will be provided at the task site.

Radiological Contamination Spill Kit: Depending on the location of the task and recommendation from RE, a spill kit shall be prepared in advance and located in appropriate work areas. These kits shall contain, at a minimum, the following radiological control equipment:

- Plastic Bags

- Absorbent materials (e.g., paper or rags)
- Latex gloves and glove liners
- Plastic shoe covers and/or rubber overshoes
- Smear paper and holders
- Pencils, grease pencils, and paper
- Radiological tags and signs and radiation rope or ribbon
- Yellow plastic sheeting and duct tape.

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Revision 0

HEALTH AND SAFETY PLAN FOR OPERATIONS PERFORMED FOR THE ENVIRONMENTAL RESTORATION PROGRAM

TASK: CHARACTERIZATION OF POTENTIAL WASTE SOURCES AT AUXILIARY REACTOR AREA-I OPERABLE UNIT 5-07 SITE ARA-02

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ADDENDUM

TASK SPECIFIC
HEALTH AND SAFETY PLAN

TASK SPECIFIC
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TASK: Characterization of Potential Waste Sources at Auxiliary Reactor Area-I Operable Unit 5-07 Site ARA-02

DATE: June 5, 1992

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HEALTH AND SAFETY PLAN

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ACRONYMS

ACGIH	American Conference of Government Industrial Hygienists
ALARA	as low as reasonably achievable
ANSI	American National Standards Institute
ARA	Auxiliary Reactor Area
bgs	below ground surface
CAU	Compliance Assurance Unit
CFA	Central Facilities Area
CGM	combustible gas meter
CLP	Contract Laboratory Program
D&D	Decontamination and Decommissioning
DAC	derived airborne concentration
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Field Office
DRD	direct-reading dosimeter
DRR	Document Revision Request
EPA	Environmental Protection Agency
ERD	Environmental Restoration Department
F&M	Facilities and Maintenance
FTL	field team leader
HAZCOM	hazardous communication
HDPE	high density polyethylene
HEPA	high efficiency particulate air (filter)
HPT	health physics technician
HSO	health and safety officer
HSP	Health and Safety Plan
IH	industrial hygiene/industrial hygienist
INEL	Idaho National Engineering Laboratory
JSS	job site supervisor
LEL	lower explosive limit

NIOSH	National Institute of Occupational Safety and Health
NIST	National Institute of Standards and Technology
OMP	Occupational Medical Program
OSHA	Occupational Safety and Health Administration
OU	operable unit
OVA	organic vapor analyzer
PCB	polychlorinated biphenyl
PD	Program Directive
PEL	permissible exposure limit
PID	photoionization detector
PPE	personal protective equipment
ppm	parts per million
QA/QC	quality assurance/quality control
QE	quality engineer
QPP	Quality Program Plan
RCRA	Resource Conservation and Recovery Act
RE	Radiological Engineer
REL	recommended exposure limit
RI/FS	Remedial Investigation/Feasibility Study
RML	Radiation Measurements Laboratory
RWMC	Radioactive Waste Management Complex
SAR	Safety Analysis Report
SCBAs	self-contained breathing apparatus
SVOC	semivolatile organic compound
SWP	safe work permit
SWR	site work release
TCLP	toxicity characteristics leaching procedure
TLD	thermoluminescent dosimeter
TLV	threshold limit value
VOA	volatile organic analysis
VOC	volatile organic compound

WAG	waste area group
WCC	Warning Communications Center

TASK SPECIFIC
HEALTH AND SAFETY PLAN

A.1 Introduction

Task: Characterization of Potential Waste Sources at Auxiliary Reactor Area (ARA)-I Operable Unit (OU) 5-07 Site ARA-02

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Date Health and Safety Plan (HSP) requested: January 15, 1992

Purpose of Task: As part of the Track 2 investigation of OU 5-07, the waste materials present in the ARA-02 sanitary septic system (consisting of three septic tanks, a seepage pit, and associated system piping) and soils adjacent to the septic system components will be sampled and analyzed to identify the types and concentrations of contaminants present. Additional data collection at OU 5-07 Site ARA-03 is not necessary.

Proposed Dates of Work: July 6 through July 10, 1992.

A.1.1 Scope of Work

Samples will be collected from within the ARA-02 sanitary septic system mainline piping, septic tanks (three), and seepage pit and from soils surrounding the septic system components. Samples from the 8-in. concrete mainline will be collected at each of the three manhole locations and will likely be composed of soil and gravel. It is anticipated that liquid and sludge samples will be collected from each of the three septic tanks. Soil samples will be collected from the gravel base of the seepage pit. In addition, soil samples will be collected at three locations alongside the mainline pipe, two locations next to the septic tanks, and two locations outside of the seepage pit. All samples will be composite samples except those collected for volatile organic analysis (VOA), which will be grab samples. Samples will be analyzed for Contract Laboratory Program (CLP) metals; CLP volatile organic compounds (VOCs); CLP semivolatile organic compounds (SVOCs); CLP polychlorinated biphenyls (PCBs); and alpha-, beta-, and gamma-emitting radionuclides.

Drawings produced from as-built blueprints of the sanitary septic system show the locations of the septic tanks, seepage pit, and associated piping and manholes. A diagram of the ARA-02 sanitary septic system and ARA-I facility source buildings is presented as Figure A-1. Figure A-2 is a cross-section profile of the ARA-02 sanitary septic system. Figures A-3 and A-4 show construction details of the three septic tanks and seepage pit, respectively. A detailed discussion of the ARA-02 sanitary septic system, sampling strategy and methodology, and analysis methods to be used is presented in the Sampling and Analysis Plan for Characterization of Potential Waste Sources at Auxiliary Reactor Area-I Operable Unit 5-07 Sites ARA-02 and ARA-03 (EG&G 1992).

A.1.2 Background

This section presents information regarding the background of OU 5-07 Site ARA-02. Specific information regarding the ARA-I facility is detailed in the Installation Assessment Report for EG&G Idaho, Inc., Operations at the

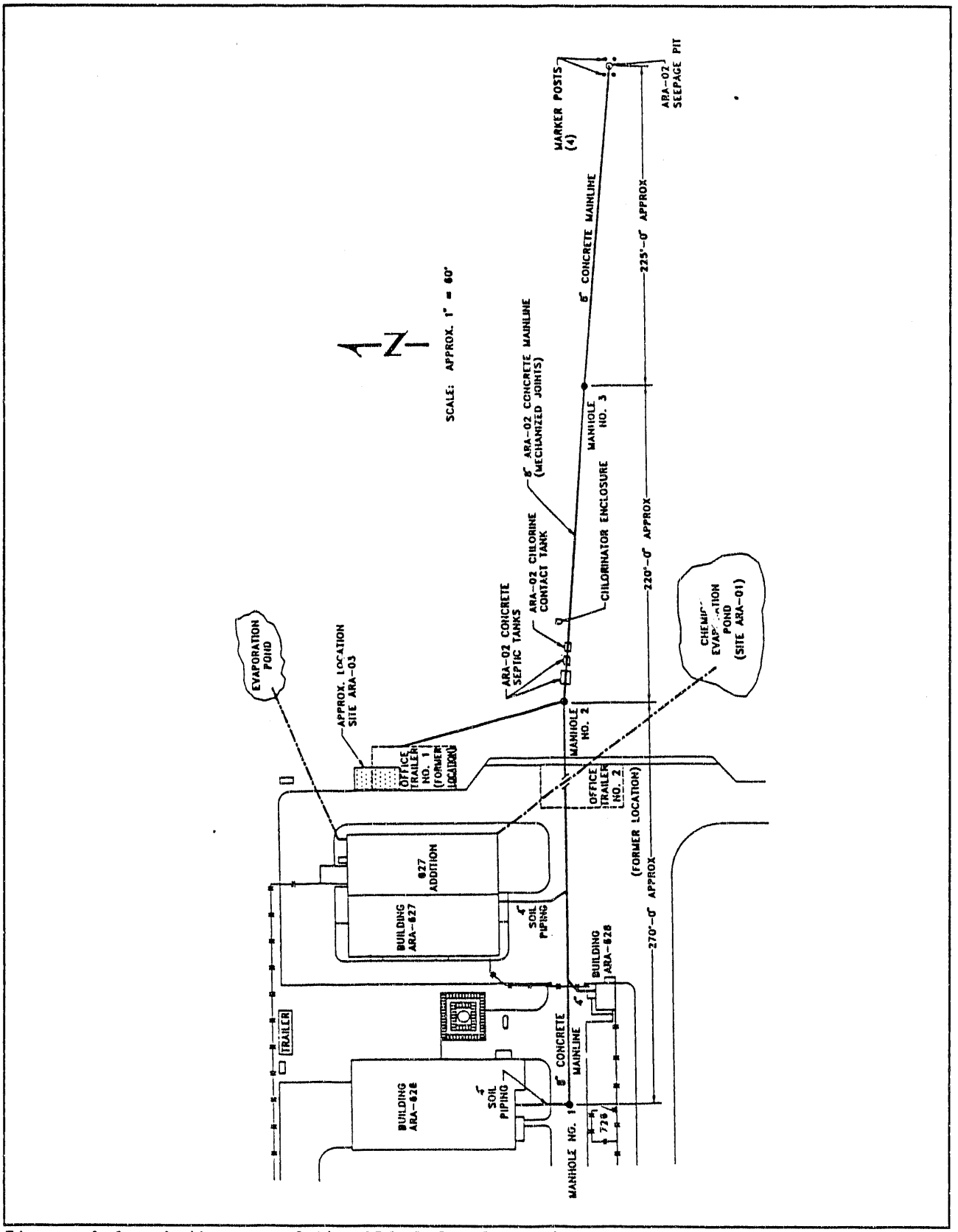

Figure A-1. A diagram of the ARA-I facility showing the ARA-02 sanitary septic system and source buildings and Site ARA-03.

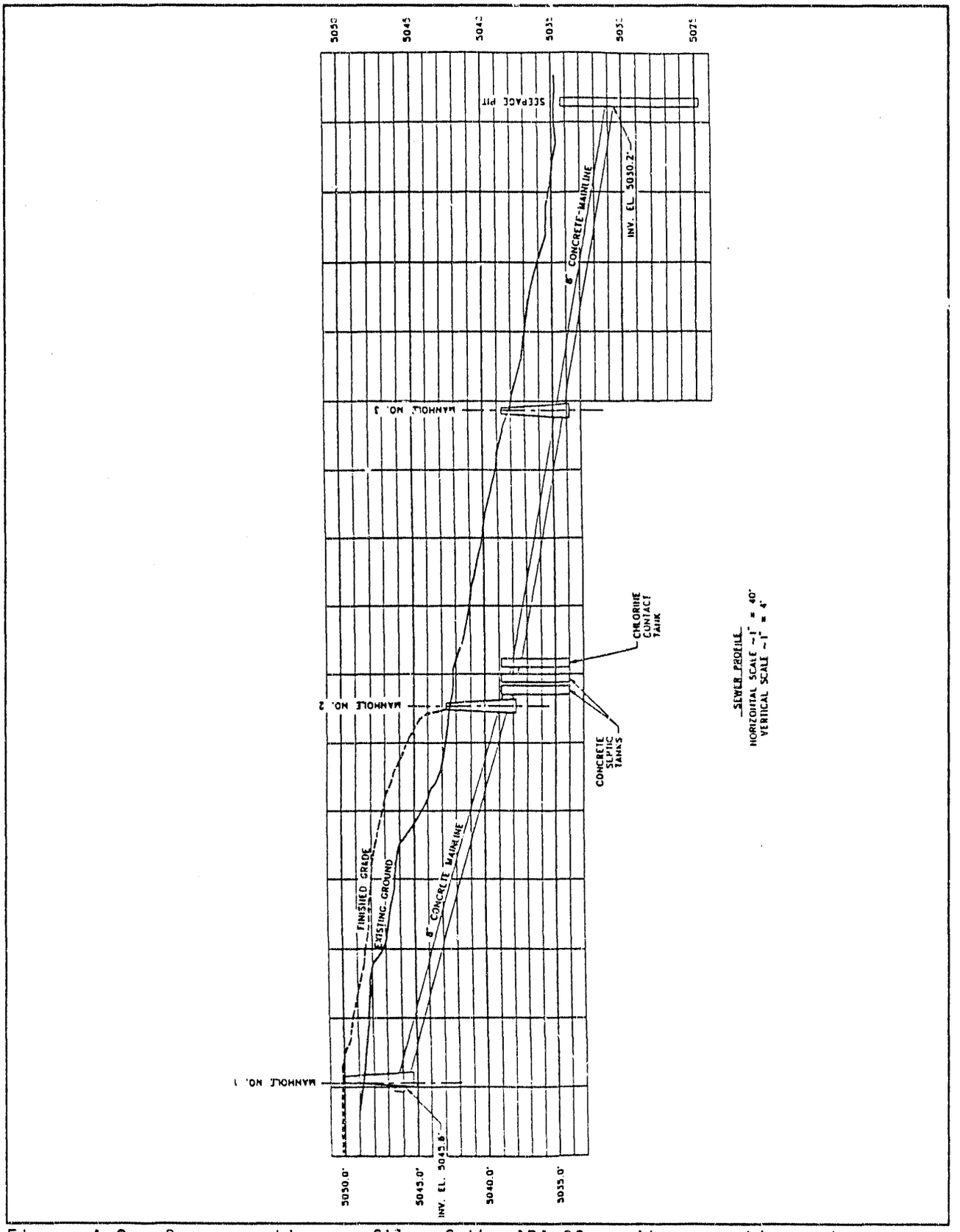

Figure A-2. Cross-section profile of the ARA-02 sanitary septic system.

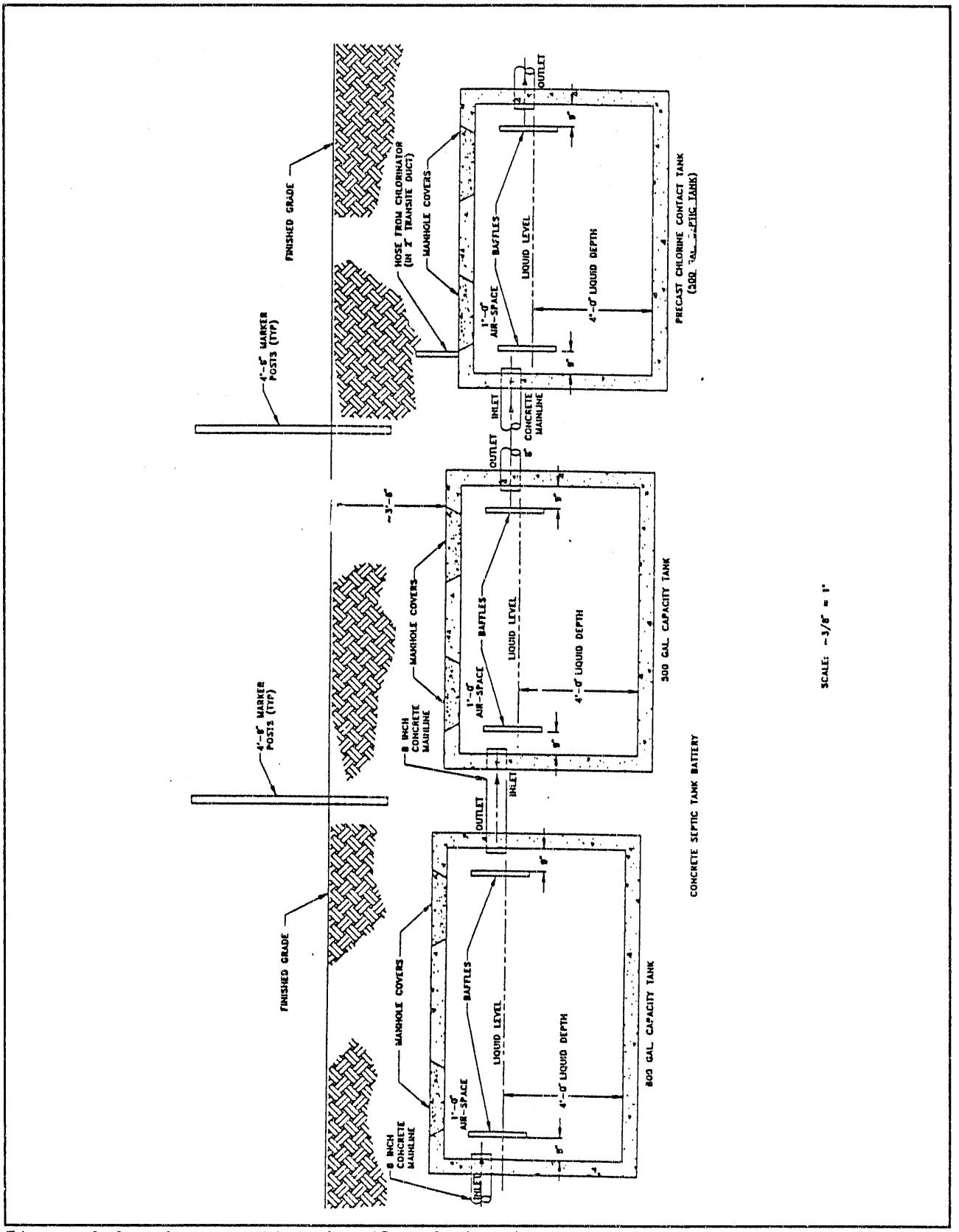

Figure A-3. Construction details of the three ARA-02 septic tanks.

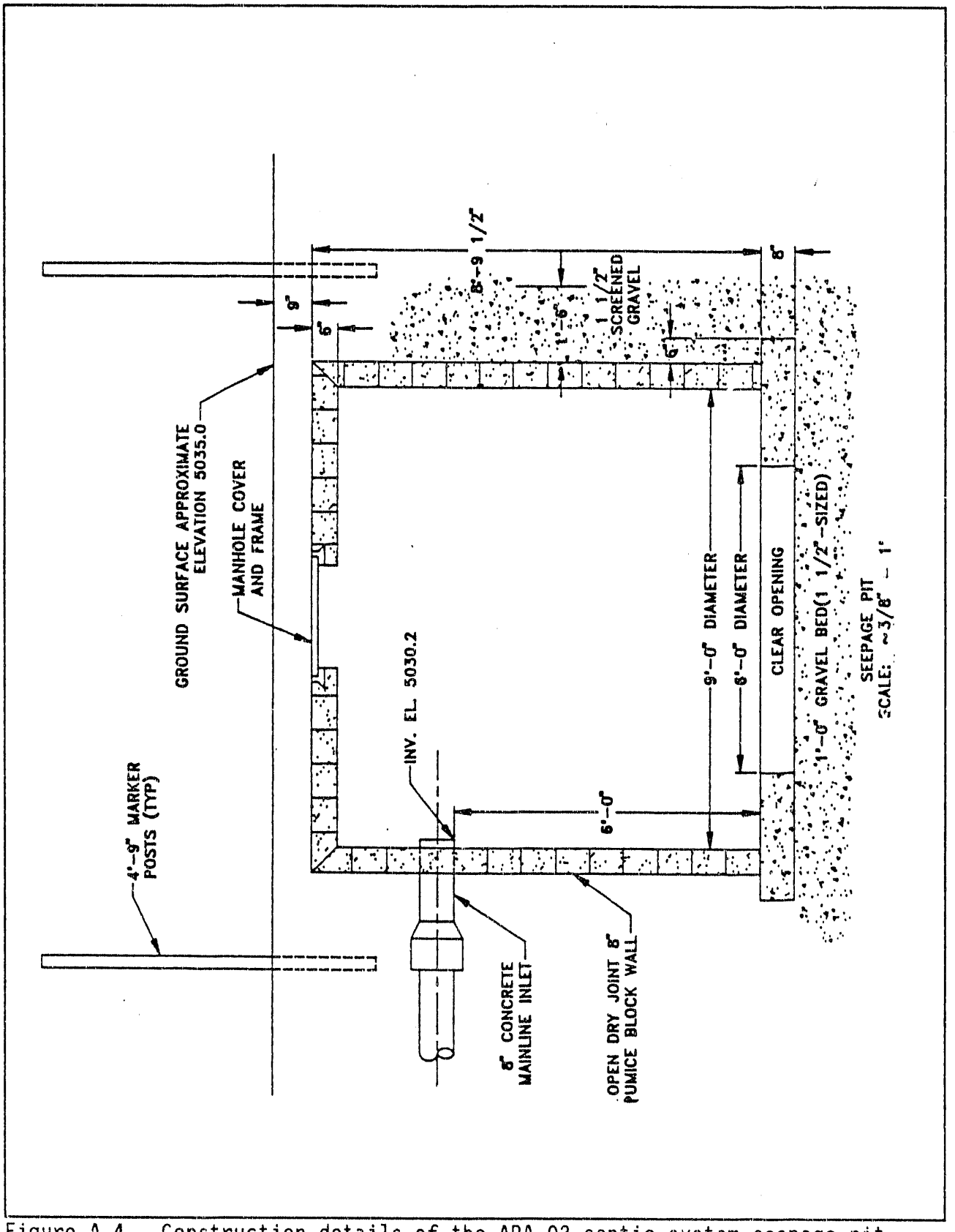

Figure A-4. Construction details of the ARA-02 septic system seepage pit.

Idaho National Engineering Laboratory (EG&G 1986) and in the following subsections.

A.1.2.1 Task Site Description: The ARA-02 site consists of a sanitary septic system which serviced buildings 626, 627, 628 and Office Trailer No. 1 at ARA-I (see Figure A-1). The system was built in 1960 and has been inactive since 1988.

Building ARA-626 was a hot cell building that was also used to support materials research. It contained a small laboratory area for sample preparation and inspection. The hazardous chemicals used at the hot cell were limited to small quantities of solvents and acids. When organic solvents were used, either methanol or acetone was used because of their high vapor pressures. Occasionally, nitric acid was used in the hot cell laboratory. The effluents generated during hot cell operations were passed through a hot sewer to a radioactive holding tank and should not have been disposed of in the sanitary septic system (EG&G 1986).

Building ARA-627 was a print shop from 1955 to 1971 that generated small amounts of rags which were occasionally wetted with acetone and printing fluids. These wastes were disposed of in a landfill. The building was later expanded and modified to serve as a research laboratory for materials development and testing. Acids and solvents were used on a routine basis. Radioactively contaminated wastes were put into the radioactive waste sewer and retained in the radioactive waste tank. Nonradioactively contaminated acids and solvents were disposed of in a chemical leach field. In 1980 the building was further modified to incorporate a radiochemistry laboratory. The minor amounts of radioactivity that were not captured during extraction operations and the organic solvents used in the extraction process were also sent to the chemical leach field (EG&G 1986).

Building ARA-628 housed the ARA-I guardhouse. Office Trailers No. 1 and No. 2 were emplaced at the ARA-I facility from 1980 until 1986, at which time the trailers were removed from the facility. No hazardous wastes were generated from these buildings.

The ARA-02 sanitary septic system includes 4-in. piping leading from each of the aforementioned buildings into an 8-in. concrete main, three septic tanks, and an associated seepage pit discharge point (see Figures A-1 and A-2). Three manholes allow access to the 8-in. concrete main. The first manhole is located at the point the 4-in. pipe from Building ARA-626 enters the 8-in. mainline, while a second manhole is located near the discharge point of the mainline into the first of three in-series septic tanks. The 8-in. main continues eastward, away from the septic tanks and other ARA-I facilities, to the seepage pit. A third manhole accesses the mainline pipe approximately halfway between the second manhole and the seepage pit. As indicated in Figure A-2, the 8-in. mainline lies approximately 3.5 to 4.0 ft below ground surface (bgs) along its entire length. Samples will be collected from within the piping at each of the manhole locations (see note on following page). In addition, soil samples will be collected at three locations alongside of the mainline to determine if leakage and subsequent migration of contaminants has occurred.

Based on Figure A-2, the septic tanks lie approximately 3.5 ft bgs, the first in the series being a distance of approximately 285 ft east of the first manhole (south of Building ARA-626). Construction details of the three septic tanks are presented in Figure A-4. The first settling tank is constructed of concrete, is 5 ft deep, and has an 800-gal capacity. The tank construction allows for a maximum accumulation of 4 ft of liquids and sludges, with a 1-ft air space above the 8-in. mainline inlet and outlets. Contents of the septic tanks have not been examined because of the tanks' inaccessibility, but it is presumed that both sludges and liquids are present in the tanks, with proportionally fewer solids in the second and third tanks. The second concrete tank lies approximately 2 ft further east and is a 500-gal capacity tank, 5 ft deep, with a maximum 4-ft liquid/sludge depth. The third tank is a 500-gal capacity precast chlorine contact tank, also 5 ft deep. It is not known if any sludges are present in this tank.

After the 3.5-ft depth of overburden soil has been removed, each of the tanks will be accessed and sampled through two manholes located above the entrance and exit points (see note below). Two sets of samples will be

collected from each of the layers present in each of the tanks. In addition, soil samples will be collected from two soil borings located exterior to the tanks to determine presence or absence of contamination from system leaks.

The 8-in. mainline piping continues eastward from the chlorine contact tank to the third manhole, a distance of 220 ft from the second manhole; the seepage pit is located an additional 225 ft east of the third manhole. Construction details of the seepage pit are shown in Figure A-4. The seepage pit is accessed via a manhole approximately 0.75 ft bgs. The 8-in. mainline pipe inlet to the seepage pit lies approximately 4.75 ft bgs. The seepage pit is constructed of 8-in. open dry joint pumice blocks lying on concrete pilings 6 ft below the mainline inlet. Screened gravel, 1.5 ft deep, surrounds the seepage pit below the mainline inlet, while a 1.75-ft thick gravel bed lies below the open base of the pit. An inspection of the seepage pit has not been conducted, but liquids are not expected to be present within the pit because of the construction design of the pit and high permeability of the surrounding soils. Samples will be collected from the gravel base of the pit and from two soil borings located exterior to the seepage pit.

> **Note:** Entry into the confined space of the mainline piping, septic tanks, and seepage pit is not anticipated at any point during this investigation as sampling will be conducted by means of long-handled sampling equipment. In the event that entrance into the mainline, septic tanks, or seepage pit is necessitated, procedures for working in a confined space will be followed and requirements met as discussed in Section A.5.2.3.

A.1.2.2 Waste Description: Process knowledge and as-built blueprints of the septic system and source buildings indicate that ARA-02 was a sanitary septic system; however, the system is known to be contaminated with radioactive materials based on existing field screening and sampling data (presented in Section A.1.2.6). No hazardous constituents are known to have been released to the unit. An inspection of the septic tank and seepage pit and their contents has not been conducted.

A.1.2.3 Unusual Features: None

A.1.2.4 Status of Task Site: The ARA-I facility and ARA-02 sanitary septic system are currently inactive.

A.1.2.5 History: ARA-I is a surplus facility that has been used in the past as a nuclear research reactor area with laboratories and various operations related to examination or storage of radioactively contaminated materials. A discussion of the probable waste sources and history of disposal at Site ARA-02 is presented in Section A.1.2.1. There have been no previous remedial response actions taken at Site ARA-02.

A.1.2.6 Previous Onsite Monitoring and Sampling Data: In January 1992, field screening instruments (Ludlum 14C) detected 0.7 and 40 mR/hr beta-gamma on contact within the first and second manholes, respectively, accessing the 8-in. mainline. Field strengths at the manhole coverings were <1.0 mR/hr beta-gamma on contact, while readings at the ground surface above the system components did not exceed background levels. Field screening surveys for alpha contamination or organic vapors were not conducted. Samples were collected from the first and second manholes on the same date; the samples consisted largely of dry soil and gravel-sized rocks. These samples were analyzed by gamma spectroscopy and found to contain the radionuclides cesium-137 (Cs-137) at 9.2E+01 pCi/g and cobalt-60 (Co-60) at 1.4E+03 pCi/g (first manhole), and Cs-137 at 3.8E+02 pCi/g, Co-60 at 6.0E+03 pCi/g, and uranium-235 (U-235) at 1.0E+02 pCi/g (second manhole). There has been no chemical characterization of the ARA-02 sanitary septic system materials or surrounding soils.

A.2 Responsibilities

Key personnel in the Track 2 investigation of OU 5-07 are listed below; their organization is shown in Figure A-5.

Personnel	Discipline/Tasks Assigned
R. J. Bargelt	Waste Area Group (WAG)-5 Manager/ Project Manager
T. N. Thiel	ARA-I Facility Landlord
S. L. Pickett	FTL/JSS
R. T. Evans	CAU IH/HSO
R. W. Jones	CAU RE
Central Facilities Area (CFA) Health Physics Technician (HPT)	Health Physics
MSE, Inc., Butte, MT	Sampling Team
V. W. Watson	Quality Engineer (QE)
P. N. Creighton	Occupational Medical Program (OMP)
Laboratory	
Environmental Restoration Department (ERD)-approved contracted laboratory	Chemical analyses
Radiation Measurements Laboratory (RML)	Gamma spectroscopy
ERD-approved contracted laboratory	Alpha spectroscopy and strontium-90

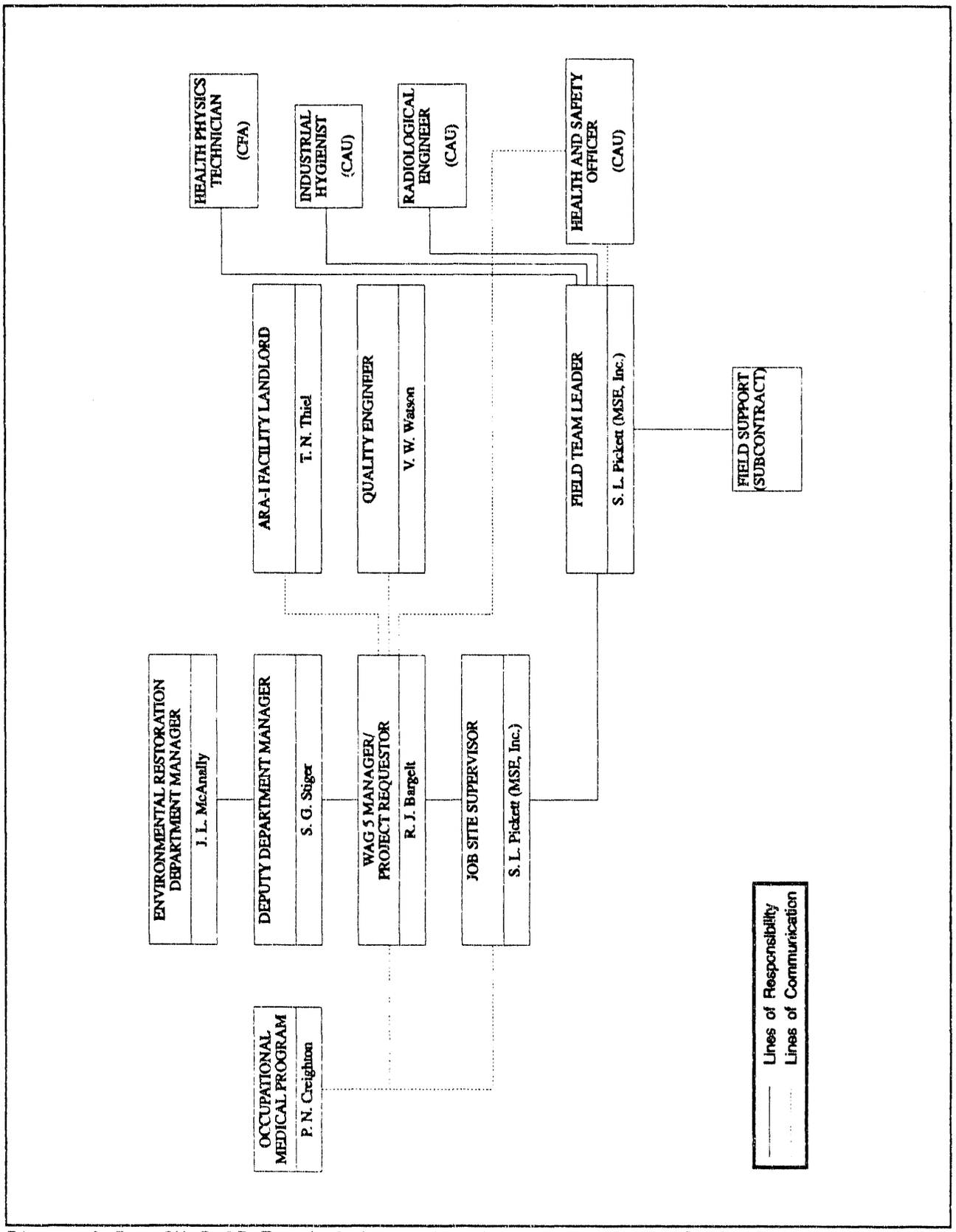

Figure A-5. OU 5-07 Track 2 investigation organizational chart.

It is the responsibility of the IH/HSO, HPT, and the FTL/JSS to ensure that all requirements stated in the Health and Safety Plan for Operations Performed for the Environmental Restoration Program (Morton 1991) (referred to as the "ERD generic HSP") and this task specific addendum are complied with, and that the effectiveness of this HSP is evaluated.

This HSP meets the specific requirements identified in DOE 5480.10, "Contractor Industrial Hygiene Program;" DOE/ID 5483.1A, "Occupational Safety and Health Standards;" and DOE/ID 5480.4, "Environmental Protection, Safety and Health Protection Standards." Per these orders, DOE and DOE-ID require contractor organizations to comply with applicable Occupational Safety and Health Administration (OSHA) regulations, American National Standards Institute (ANSI) standards, American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit values (TLVs), OSHA permissible exposure levels (PELs), and National Institute for Occupational Safety and Health (NIOSH) recommended exposure levels (RELs) for exposures to chemical and physical agents.

A.3 Personnel Training

In addition to the general training requirements found in the ERD generic HSP (Morton 1991), personnel working on the OU 5-07 Site ARA-02 waste source characterization investigation will be briefed by the FTL/JSS before commencement of any activities at this site. Personnel will be trained to recognize the symptoms of overexposure to the hazards likely to be encountered (see Section A.5). The FTL/JSS will ensure that all personnel have read this document, the Sampling and Analysis Plan for Characterization of Potential Waste Sources at Auxiliary Reactor Area-I Operable Unit 5-07 Sites ARA-02 and ARA-03 (EG&G 1992a), and the ERD generic HSP (Morton 1991). All activities conducted during the OU 5-07 investigation will be performed under a Safe Work Permit (SWP) to be completed before entering the sampling areas.

Table A-1 documents the training required by sampling team members and the date it was received. The FTL/JSS will ensure all training required for field personnel is current and Table A-1 is completed prior to project startup. Training records can be obtained from the project individual's Health and Safety Permit Card (Form EG&G-2580-A), Human Resources Development Training, or PROFS-TIS. The completed Table A-1 will be copied and taped or pasted in the FTL's logbook or the sample logbook. At least two persons with current Medic First training will be on site during all sampling activities.

Table A-1. Training record for task site personnel.

Employee Name		S. L. Pickett		MSE personnel		MSE personnel	
		FTL/JSS		Field Support		Field Support	
Course Number	Topic	Required	Date	Required	Date	Required	Date
	Task Site Orientation	Initial		Initial		Initial	
	Decontamination[a]	Initial		Initial		Initial	
	Hazard Communication[a]	Initial		Initial		Initial	
	Signs, Tags, Warning Devices[a]	Initial		Initial		Initial	
TS-205	Hazardous Waste Operator	Initial		Initial		Initial	
TS-205R	Hazardous Waste Operator-Refresher	Annual		Annual		Annual	
TS-206	Hazardous Waste Supervisor	Initial		NA		NA	
TS-401	Hearing Conservation	Initial		Initial		Initial	
TS-501	Radiation Worker Qualification	Initial		Initial		Initial	
TS-501R	Radiation Worker Qualification-Refresher	Annual		Annual		Annual	
TS-502R	Limited Radiation Worker-Refresher	NA		NA		NA	
TS-503R	Observer Radiation Worker-Refresher	NA		NA		NA	
TS-701	Medic 1st	Initial		Initial		Initial	
TS-701R	Medic 1st-Refresher	Annual		Annual		Annual	
TS-801	Respirator Fit Test Qualification	Initial		Initial		Initial	
TS-802	Respirator Fit Test Requalification	Annual		Annual		Annual	
	8-hr On-The-Job-Training	Initial		Initial		Initial	

a. May be part of task orientation.

Table A-1. (continued).

Employee Name		CFA HPT		R. T. Evans (CAU IH)	
		HPT		IH/HSO	
Course Number	Topic	Required	Date	Required	Date
	Task Site Orientation	Initial		Initial	
	Decontamination[a]	Initial		Initial	
	Hazard Communication[a]	Initial		Initial	
	Signs, Tags, Warning Devices[a]	Initial		Initial	
TS-205	Hazardous Waste Operator	Initial		Initial	
TS-205R	Hazardous Waste Operator-Refresher	Annual		Annual	
TS-206	Hazardous Waste Supervisor	NA		NA	
TS-401	Hearing Conservation	Initial		Initial	
TS-501	Radiation Worker Qualification	Initial		Initial	
TS-501R	Radiation Worker Qualification-Refresher	Annual		Annual	
TS-502R	Limited Radiation Worker-Refresher	NA		NA	
TS-503R	Observer Radiation Worker-Refresher	NA		NA	
TS-701	Medic 1st	Initial		Initial	
TS-701R	Medic 1st-Refresher	Annual		Annual	
TS-801	Respirator Fit Test Qualification	Initial		Initial	
TS-802	Respirator Fit Test Requalification	Annual		Annual	
	8-hr On-The-Job-Training	Initial		Initial	

a. May be part of task orientation.

A.4 Medical Surveillance Program

The requirements for medical surveillance are adequately discussed in Section 4 of the ERD generic HSP (Morton 1991).

A.5 Hazard Evaluation

A.5.1 Potential Onsite Hazards

Process knowledge and as-built drawings indicate that Site ARA-02 was a sanitary septic system. There is no documentation of disposal of hazardous or radioactive waste into the system, although radiological contaminants are known to be present based on previous field screening and sampling results (see Section A.1.2.6). Although not anticipated to be present, some organic compounds and inorganic compounds may exist in the septic system materials and surrounding soils. The exposure routes of primary concern are ingestion and inhalation.

The potential hazards resulting from radiological contaminants are expected to be greater than those presented by chemical contaminants. The selection of personal protective equipment (PPE) and safe work procedures to be followed during sampling activities are subsequently driven by radiological hazards. Zone II anti-c clothing (see Section A.6.2.4) and a full-face respirator with a high-efficiency particulate air (HEPA) cartridge will be worn and decontamination procedures (see Section A.10) enforced to reduce the risk of exposure to radiological contaminants and to minimize dermal contact with chemical compounds.

Other potential hazards that may be encountered during Site ARA-02 sampling activities are discussed in Section A.5.2 and include: confined spaces of the septic system components resulting in the potential for an explosive environment and/or oxygen deficient atmosphere; biological hazards; industrial hazards associated with the excavation of overburden soils and the

wearing of PPE; fire, electrical, and noise hazards associated with the use of a portable generator; and temperature extremes during sampling.

A.5.2 Hazards Analysis

See Section 5 of the ERD generic HSP (Morton 1991) for additional information on the following topics.

A.5.2.1 Chemical Agents: Specific chemical agents and concentrations present in Site ARA-02 septic system materials and soils are not known as previous field screening or sampling has not been conducted for chemical constituents. Safety procedures will be enforced and the level of PPE selected so that exposure of project personnel to chemical agents will not exceed the most recently published occupational exposure values: ACGIH TLVs, OSHA PELs, and NIOSH RELs.

Because of the high volatility of most organic compounds and the long period of time since the system was active, the presence of organic compounds and vapors within the system and surrounding soils at concentrations exceeding exposure limits established by NIOSH, ACGIH, and OSHA is not likely. Previous monitoring of two septic systems (east and west sides) at ARA-II during 1991 sampling activities detected no organic vapors or explosive potentials (EG&G 1992b). The ARA-II east-side septic system received wash room sewage material and as such should be very similar to the processes and wastes at the ARA-02 sanitary septic system. The presence of organic vapors and methane gas will be monitored for upon initial opening of the system components using an HNu photoionization detector (PID) and a combustible gas meter (CGM), respectively. If any organic vapors are detected, additional field screening will be conducted during sample collection.

A respirator with an organic cartridge will be worn and personal air samples will be collected if the IH/HSO determines that the concentration of organic vapors in the breathing zone warrant such. A concentration of organic vapors of 5 parts per million (ppm) in the breathing zone for a period of 5 min. or within 10% of the lower explosive limit (LEL) for methane will

result in a temporary cessation of sampling activities while safety precautions, including appropriate PPE, are reassessed. Action levels are discussed in Section A.6.3.

Lead, mercury, barium, chromium^{+3}, and chromium^{+6} are known to be common to many septic tank systems at the INEL; however, based on process knowledge and data from the 1991 sampling of two ARA-II septic systems, the presence of these contaminants within the system and surrounding soils at concentrations exceeding exposure limits established by NIOSH, ACGIH, and OSHA is not likely (see Table A-2). Samples collected during the 1991 sampling of the ARA-II east- and west-side septic systems indicated that metals were present at concentrations significantly below toxicity characteristics leaching procedure (TCLP) regulatory levels. The use of Zone II anti-c clothing and a full-face respirator with a HEPA cartridge will be sufficient to preclude the contamination of sampling personnel via airborne contamination and direct exposure to chemical contaminants. The potential for airborne exposure and subsequent inhalation of inorganic contaminants is further mitigated because the contaminants will largely be contained within the sample matrix.

A.5.2.2 Fire and Explosion Hazards: There is a potential for an explosion hazard because of the possible build-up of methane gas within the septic system components. The integrity of the components is not known and it has not been determined whether the gas has escaped or is maintained within the system. No previous field screening of the septic system has been conducted to determine if an explosive environment is present; however, no organic vapors or explosive potentials were detected using industrial hygiene field screening instruments during 1991 sampling of two septic systems at ARA-II (EG&G 1992b).

The project IH/HSO will determine if an explosive environment exists within any of the septic system components upon opening, just prior to sampling, and during sample collection activities. An MSA CGM will be used to measure explosive potential and an HNu PID (or equivalent) or organic vapor analyzer (OVA) will be used to measure organic vapor concentrations. Action

Table A-2. Occupational exposure values.

Substance	ACGIH TLVs		OSHA PELs		NIOSH RELs	
	TWA[a] ppm mg/m^3	STEL/CEIL(C)[b] ppm mg/m^3	TWA ppm mg/m^3	STEL/CEIL(C) ppm mg/m^3	TWA ppm mg/m^3	STEL/CEIL(C) ppm mg/m^3
Barium, soluble compounds, as Ba	0.5	–	0.5	–	0.5	–
Chromium^{+3} compounds, as Cr	0.5	–	0.5	–	0.5	–
Chromium^{+6} compounds, as Cr	0.05	–	0.05	–	0.05	–
Lead, inorganic dusts and fumes, as Pb	0.15	–	0.05	–	0.10	–
Mercury, all forms except alkyl vapor, as Hg	0.05	–	0.05	–	0.10	–

a. TWA– Time weighted average
b. STEL/CEIL(C)– Short term exposure limit/ceiling

levels are presented in Section A.6.3. This information will be used to further assess the adequacy of the selected PPE to be used during task activities.

Fire hazards during this project are associated with methane gas in the system components (if present) and the gasoline powered portable generator used to power a peristaltic pump used to collect liquid samples from the septic tanks. The generator may also be used to power a space heater located in the designated warmup zone (ARA-I guardhouse).

The presence of methane will be monitored for prior to commencement of sampling activities. If methane is present, the components will be ventilated until concentrations of organic vapors are less than 10% of the LEL for methane. The location of the space heater within the warmup zone will be such that it does not present a fire hazard; the heater will be turned off when unattended. The generator will be located outdoors and will be positioned in such a manner that exhaust will not be drawn into an occupied enclosed area. The generator will be turned off and will be cool before refueling. Fuel for

the generator will be stored in approved and labeled containers and will be stored within the ARA-I guardhouse at opposite ends from the space heater. The ARA-I guardhouse will be posted as a "NO SMOKING" area. No other fire hazards are anticipated.

A.5.2.3 Oxygen Deficiency/Confined Space: The ARA-02 sanitary septic system piping and septic tanks qualify as confined spaces and as such may contain an explosive environment and/or an oxygen deficient atmosphere. Explosive potentials of the system components will be determined as discussed in Section A.5.2.2. The project IH/HSO will monitor for oxygen content in the breathing space at the beginning of sampling activities. Minimum oxygen levels of 20.5% were detected within ARA-II septic tank components during 1991 sampling activities (EG&G 1992b).

Entry into any of the system components is not anticipated at any point during sampling activities as sampling will be conducted by means of long-handled sampling equipment. In the event that entry into any of the confined spaces of the system is required to obtain sample material, activities will be performed under the direction of a confined space entry permit. Activities conducted in confined spaces will meet all requirements specified in the ERD generic Safety Analysis Report (SAR) (under review). The ERD SAR requires that any activity within a confined space be conducted under conditions in which the ventilation is equivalent to outside air, i.e. a minimum wind speed of 4.9 ft/s (1.5 m/s). In addition, samplers will be required to have current confined space training to be given by the project IH/HSO, R. T. Evans, a qualified confined space worker. For additional information on confined spaces, including training requirements, refer to Section 11.3, "Working in Confined Spaces," of the EG&G Company Procedures Manual, and Section 19.0, "Requirements for Working in Tanks and Confined Spaces," of the EG&G Industrial Hygiene Manual.

A.5.2.4 Radiological Hazards: Results of previous radiological surveys and sampling of the ARA-02 septic system mainline are discussed in Section A.1.2.6. However, the remaining system components and surrounding soils have not been surveyed or sampled. To ensure radiation exposure and

radiological contamination is controlled to levels that are "as low as reasonably achievable" (ALARA), a number of precautions will be taken to control radiation in the performance of work. The ALARA program is described in Chapter 2.0, "External Radiation Exposure Control," of the EG&G Radiological Controls Manual. A review of existing information and the six ALARA criteria presented in Appendix 2.A of the EG&G Radiological Controls Manual indicated that a full ALARA review and evaluation be performed using the guidance in Appendix 2.A. The ALARA evaluation and review is presented as Appendix A of this HSP.

The sections of the ALARA review and evaluation (Appendix A) requiring post-job review will be filed in upon project completion. A document revision request (DRR) will be submitted, as stipulated in ERD PD 4.1, "Document Control," and the completed appendix will be incorporated into the revised document. Based on the ALARA review, Site ARA-02 will initially be designated as a Zone II contamination control area. Zone requirements may be reduced once levels of radiation have been better quantified. Activities of personnel at Site ARA-02 will be limited to means of access and areas adjacent to the sites. Zone II anti-c clothing and a full-face respirator with a HEPA cartridge will be worn by sampling personnel during all site activities to reduce the risk of exposure to radiological contamination. The onsite HPT will be present throughout the project to monitor work areas, sample materials, equipment, and personnel. Radiological contamination and radiation exposures will be monitored using a Ludlum 61, Ludlum 2A, Ludlum 14C, and an RO 3A instrument (or equivalents). Airborne sampling devices are to be used in any area that is known to contain, that is suspected to contain, or where activities may create airborne radioactive concentrations greater than 1.0% of the derived airborne concentration (DAC) values listed in Appendix 3.A, Table A-1 or A-3 of the EG&G Radiological Controls Manual. Constant air monitoring will be performed throughout the duration of this project by means of portable air sampling. All personnel will wear a thermoluminescent dosimeter (TLD) and direct-reading dosimeter (DRD) while within the ARA-I facility and will receive a whole-body frisk before leaving the work areas. All personnel will wash thoroughly after the whole body frisk as discussed in

Section A.5.2.5. Action levels for radiological exposures and contamination are presented in Section A.6.3.

A.5.2.5 Biological Hazards: Site ARA-02 was a sanitary septic system through which washroom wastes were routed; as such, the system contains potential biological hazards. Personnel will exercise good personal hygiene and will wash hands, arms, or other affected body parts with an anti-bacterial soap immediately after sampling this site, and prior to eating, drinking, smoking, applying cosmetics, or otherwise possibly ingesting potential bacterial agents. A wash area will be set up in the ARA-I guardhouse and will consist of a wash basin with anti-bacterial soap and a rinse basin. Potable water for washing will be transported to the site in 5-gal carboys. Wash and rinse water will be disposed of in the septic system upon project completion. Zone II anti-c clothing will be worn throughout sampling activities; this level of PPE will be sufficient to ensure there is no direct exposure of the body to biological hazards.

A.5.2.6 Industrial Safety Hazards: Access to the three septic tanks is by way of manholes which lie approximately 3.5 ft bgs, while the seepage pit access point is approximately 0.75 ft bgs (see Figure A-2). Soils overlying the access manholes will be excavated prior to sampling. Excavation, trenching, shoring and subsequent backfilling, compacting, and leveling of overburden soils will be performed by trained operators in accordance with 29 CFR 1926, Subpart P, and Appendix B, "Excavation, Trenching, and Shoring" of Section 20, "General Working Conditions," of the EG&G Safety Manual. Excavation specifications will be such that personnel can safely enter the excavation area in order to sample the tanks and seepage pit. Warning barriers and signs will be placed around the excavation areas. Entrance into an excavated area will be made only after inspection by and under the direction of the IH/HSO.

The wearing of Zone II anti-c clothing (full-face respirators, in particular) may reduce the worker's ability to move freely, see clearly, or hear directions or noise that might indicate a hazard. The selected level of

PPE can also increase the risk of heat stress. Personnel will adjust their work activities to accommodate existing limitations.

A.5.2.7 Electrical Hazards: The generator, peristaltic pump, space heater (if used), and extension cord(s) will be kept out of or away from any water present at the work site. Ground fault interrupters will be used in-line with all portable electrical generating devices. Activities will be suspended if there is any chance of significant precipitation occurring during the work that will impact worker safety. Electrical supply cords will be routed in such a manner as to prevent trip hazards. Procedures to be followed during any electrical work are identified in Section 10.0, "Electrical Safety," of the EG&G Safety Manual.

A.5.2.8 Heat or Cold Stress: During extreme weather conditions, proper exposure monitoring, clothing, fluid intake, and/or work rest regimen will be implemented by the on-site IH/HSO per Section 20, "Temperature Extreme Requirements," of the EG&G Industrial Hygiene Manual. The IH/HSO will consult with the FTL/JSS when temperature extremes present a potential for heat or cold stress. Because sampling is to be conducted in May, cold stress is not anticipated, but proper precautions will be taken in the event that extremely cold (or cool and windy) conditions develop. Any team member who exhibits heat stress symptoms such as dizziness, profuse sweating, skin color change, vision problems, or confusion (or cold stress symptoms such as white skin, loss of feeling in hands or feet, or shivering) will be removed immediately from the work area and allowed to rest and recover. If symptoms persist, the team member will be taken to the nearest the CFA medical clinic (Building CFA-603).

A.5.2.9 Noise Hazards: The generator will be located under the direction of the IH/HSO to ensure noise levels are maintained below a time weighted average of 85 dBA. If necessary, a hearing conservation program will be initiated for affected personnel. All sampling personnel will have successfully completed hearing conservation training.

A.5.2.10 Other Hazards: No other hazards are anticipated.

A.6 Levels of Protection and Personal Protective Equipment

A.6.1 Expected Protection Levels

Based on process knowledge, previous field screening and sample results, anticipated levels of contamination, and an ALARA review and evaluation (see Appendix A), Zone II anti-c clothing and a full-face respirator with a HEPA cartridge will be worn during sampling of the ARA-02 sanitary septic system. The project HPT and RE shall define the anti-c requirements for working within the sampling areas on the basis of contamination levels determined by radiation surveys to be performed before the initiation of sampling. Requirements for Zone II anti-c clothing and respirator may be reduced at the discretion of the project HPT and IH/HSO once radiological contaminants are better quantified. Zone II radiological control zones shall be established at each sampling location by the onsite HPT. All necessary radiological decontamination and donning and doffing of Zone II anti-c clothing will be performed under the direction of the project HPT and in accordance with Section 10.4, "Decontamination of Personnel and Personal Property," of the EG&G Company Procedures Manual, Vol. II, and Section 10 of the generic HSP (Morton 1991). Step-by-step procedures for decontamination and donning and doffing of Zone II anti-c clothing will be posted on site at the exit area (step-off pad).

A.6.2 Personal Protective Equipment

Levels of Protection Required (Task 1): Zone II anti-c clothing and full-face respirator with HEPA cartridge.

A.6.2.1 Respiratory and Dermal Requirements - PPE: Dermal protection will be required during Site ARA-02 sampling activities because of the radiological hazards known to be present and because of the potential for splashing of chemical contaminants during sampling of liquids and sludges present in the septic tanks. Minimum zone II anti-c clothing requirements (see Section A.6.2.4) will meet the dermal requirements unless the project HPT and IH/HSO determine otherwise based upon initial field surveys of the work areas.

Respiratory protection commensurate with contamination levels will be used; it is anticipated that a full-face respirator with a HEPA filter will be sufficient. Respiratory protection is selected using criteria found in Section 18.0, "Personal Protective Equipment," of the EG&G Industrial Hygiene Manual and Section 11.1, "Respiratory Protection Program Procedures," of the EG&G Company Procedures Manual, Vol. II.

A.6.2.2 Selection Criteria: The requirement for Zone II anti-c clothing and a full-face respirator with a HEPA cartridge is based on the results of previous investigations at Site ARA-02 indicating radiological hazards (see Section A.1.2.6), an ALARA review and evaluation, and the potential for dermal contact with organic and/or inorganic compounds and biological agents.

Respiratory protection for organic vapors and other airborne chemical contaminants is required whenever personnel are exposed to concentrations greater than the lowest occupational exposure values established by OSHA (PELs), NIOSH (RELs), or ACGIH (TLVs) (see Table A-2). Respiratory protection for particulate radionuclides will be required when surface contamination levels meet Zone III criteria (>20000 dpm/100 cm^2 beta-gamma and >250 dpm/100 cm^2 alpha) or when airborne radioactivity exceeds 10% of the DACs specified in Appendix 3.A, Table A-1 and A-3, Section 3, "Internal Radiation Exposure Control," of the EG&G Radiological Controls Manual. All exposure limits are selected to ensure the health and safety of the workers.

A.6.2.3 Modification for Personal Protection Requirements: Modifications of personal protection requirements, including increasing or decreasing the required level of anti-c clothing, are not anticipated unless the HPT and the IH/HSO determine otherwise based on field screening results.

A.6.2.4 Levels of Protection: Section 6.6 of the generic HSP discusses personnel protection in radioactively contaminated areas, including anti-c clothing requirements. Zone II anti-c clothing is anticipated to be suitable for Site ARA-02 sampling activities and will consist of the following:

- One pair yellow cloth anti-c coveralls (or disposable)
- One yellow cloth hood (or disposable)
- Three pairs of shoe covers (two must be vinyl)
- One pair latex gloves.

Personal clothing other than underwear, shoes, and socks shall not be worn in the Zone II areas. For entry into a Zone II, all openings between the coveralls and shoe covers, gloves, and hood shall be taped. Anti-c clothing shall be donned only at or near the contamination control point of the area to be entered.

Additional PPE that may be recommended by the HPT and/or IH/HSO include:

- Rubber gloves with cotton glove liners
- Safety shoes with chemically resistant shoe covers
- Eye protection
- Work clothing suitable for conditions
- Hard hats
- Hearing protection.

A.6.3 Action Levels Regarding Limitations in Tasks Assigned, PPE Requirements, and Withdrawal from Site

If, during initial surveying of sampling locations, direct-reading instruments indicate conditions exceeding action levels presented below, work at that location shall be discontinued until the hazard is identified and eliminated. Actions necessary for mitigation of hazards shall be determined by the IH/HSO, HPT, and FTL/JSS. Monitoring of the breathing space air for organic vapors and the working area for radiation exposures and radiological contamination will be performed by the onsite IH/HSO and/or HPT, respectively. The IH/HSO will take HNu PID (or equivalent) instrument readings upon initial opening of the ARA-02 septic system components to determine the general levels of organic vapors present in the ARA-02 septic system components and ambient air. If any organic vapors are present, additional screening will be conducted periodically throughout the sampling project and whenever samples

are withdrawn. The HPT will take RO 3A (or equivalent) instrument readings to determine personnel dose rates while a Ludlum 2A and/or Ludlum 61 will be used to determine levels of contamination present. The project IH/HSO and HPT will assess protection requirements and prescribe any other required precautions following initial field screening and before sampling.

If any of the following instrument readings are observed, the corresponding actions will be taken:

- Oxygen meter reading $\leq$ 19.5% O_2 — Cease work; evacuate area; ventilate area
- HNu PID (or equivalent) reading > 10 ppm above background total volatile organics — Cease work; ventilate area; evaluate PPE requirements
- MSA combustible gas meter reading 10% lower explosive limit (LEL) — Cease work; ventilate area.

The above action levels would likely be exceeded only if entrance into the confined space of a system component is made. Areas exceeding action levels will be ventilated by means of large fans or by otherwise increasing the flow of ambient air into the systems to achieve conditions equivalent to outside air [i.e., 4.9 ft/s (1.5 m/s)].

The ALARA evaluation and review (Appendix A) presents the current known and expected levels of contamination at Site ARA-02. Activities will be suspended when (a) radiation levels exceed 10 mrem/h or (b) a sampling area qualifies as a radiation contamination Zone III instead of a Zone I or II upon radiological surveying, indicating that radioactive concentrations exceed the limits acceptable for the level of PPE listed on the SWP.

Review of the situation by the HPT, IH/HSO, FTL/JSS, and appropriate area personnel is required prior to resuming activity.

A.7 Safe Work Practices

A.7.1 Variations to Safe Work Practices Listed in Section 7 of this H&S Plan

No variations to the safe work practices are anticipated. All work will be done in accordance with the safe work practices outlined in Section 7 of the ERD generic HSP. This shall include working in teams (the "buddy system").

A.7.2 Additional Safe Work Practices for the Task Site

The SWP will be consulted prior to sampling activities to confirm the level of protection required. A whole-body frisk will be performed on all personnel, and all tools and equipment will be surveyed by an HPT for release prior to removal from the sampling areas.

A.7.3 Drums and Other Containers

Disposable sampling supplies and PPE used during this sampling project will be containerized in the proper receptacle(s) and disposed of in accordance with Section 3.3.5 of the Sampling and Analysis Plan for Characterization of Potential Waste Sources at Auxiliary Reactor Area-I Operable Unit 5-07 Sites ARA-02 and ARA-03 (EG&G 1992a).

A.8 Work/Radiation Zones, Site Entry, and Security

A.8.1 Description of Work Zones

Prior to sampling, the IH/HSO and HPT shall establish work area perimeters around each site. Based on available data and expected levels of contamination (see Appendix A), the ARA-02 sanitary septic system will initially be established as a Zone II contamination control zone. Modifications to these perimeters can be made as deemed appropriate by the IH/HSO or HPT based on initial and/or continuous survey data. These modifications must be approved by the FTL/JSS. No eating, drinking, smoking, or applying of cosmetics shall be allowed within the established work areas. Entry into the work zones will be strictly controlled by the FTL/JSS, so that a limited number of personnel is in the work area at any one time. Visitors must comply with the PPE, dosimetry and other requirements of this HSP and must demonstrate proof of the training requirements specified in Section 2.16 of the ERD generic HSP (Morton 1991). The FTL/JSS will inform all visitors of the contents of this HSP prior to visitor entry into the work area. A record of all visitors, showing name(s), training received, and purpose on the site, will be made in the FTL/JSS's logbook.

A.9 Environmental and Personnel Monitoring

A.9.1 Operations and Monitoring Equipment Checklist

Table A-3 shows the equipment needed for this project. In addition, each member of the sampling team will be required to wear a TLD and DRD while on the site. Dosimeters are read and calibrated on a monthly basis.

Portable radiological survey instrumentation will be calibrated every six months by the Health Physics Instrument Laboratory using calibration procedures that conform to ANSI N323-1978, "Radiation Protection Instrumentation Test and Calibration," and using sources directly or indirectly traceable to the National Institute of Standards and Technology (NIST). Radiological monitoring instruments will also be source checked weekly in accordance with Section 10.6, "Calibration and Field Checks for Health Physics Instruments," of the EG&G Company Procedures Manual, Vol. II. The HNu will be calibrated by the manufacturer annually; in addition, the

Table A-3. Operations and monitoring equipment.

Type of Equipment	Number Needed	Calibrated
PID, HNu or equivalent	1	Daily as required
MSA CGM	1	Weekly as required
Oxygen meter (direct-reading)	1	Weekly as required
Portable alpha survey, Ludlum 61 or equivalent	1	Semiannual
Portable beta-gamma survey, Ludlum 2A or equivalent	1	Semiannual
Low range direct, Ludlum 14C or equivalent	1	Semiannual
Ion chamber instrument, RO 3A	1	Semiannual

instrument will be field-calibrated prior to use using the calibration procedure found in Section 11.4, "Calibration of Industrial Hygiene Equipment," of the EG&G Company Procedures Manual, Vol. II. User calibration data shall be maintained on an instrument calibration log similar to the one depicted in Section 11.4 of the EG&G Company Procedures Manual, Vol. II. Other monitoring instruments will be calibrated and maintained according to manufacturer's specifications and schedule.

A.9.2 Medical Surveillance Procedures

The FTL/JSS will ensure that any employee performing hazardous waste handling has been properly identified to the OMP for inclusion in the Hazardous Material Surveillance Program. For additional information regarding medical surveillance and the OMP, see Section 4 of the generic body of this HSP.

A.9.3 Personnel Monitoring

Job to be Performed	Personal Monitoring Device(s)
All personnel, all sampling activities	TLDs and DRDs will be worn on person; Personnel will survey after sampling using a Ludlum 2A and Ludlum 61 (or equivalent) Breathing zone air and general ambient air to be monitored by the site IH/HSO using an HNu and/or other approved industrial hygiene air sampling instruments/procedures Body "frisks" for radioactive contamination will be performed by the site HPT.

A.9.4 Operating Procedures and Methods for Surveillance

For additional information see Section 9.4 of the generic HSP.

A.9.4.1 Heat/Cold Stress: All personnel shall be instructed of the hazards of heat and cold stress and methods of detecting and preventing injury (see

Section A.5.2.8). A warmup zone will be established in the ARA-I facility gatehouse/guardhouse. Work will stop at the recommendation of the IH/HSO or FTL/JSS.

A.9.4.2 Barriers, Signs, and Tags: Certain areas of radioactivity at ARA-I were previously identified and are posted. Contamination areas established by the HPT will be posted in accordance with procedures in the EG&G radiological control manual. Biohazard tags will be posted at the perimeter of each of the septic system sample locations. In addition, the ARA-I guardhouse will be established and posted as a "NO SMOKING" area. Warning barriers and signs will be placed around the excavations required to access the septic tanks and seepage pit.

A.10 Decontamination Procedures

A.10.1 Personnel Decontamination Procedures

A.10.1.1 Chemical and Biological Decontamination: If the skin comes into contact with ARA-02 sanitary septic system materials (sludge or liquid), the affected area will be washed with soap or mild detergent and rinsed with large amounts of water (approximately 15 to 20 minutes) until no evidence of contamination remains. The wash area will be established in the ARA-I guardhouse as discussed in Section A.5.2.5.

In case of eye contact, the eyes will be washed immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains. A volume of portable eyewash sufficient to maintain a constant flow for approximately 15 to 20 minutes will be set up in a readily accessible area at the site (ARA-I guardhouse). The IH/HSO will determine if immediate medical attention is warranted in the event of skin or eye contamination.

A.10.1.2 Radiological Decontamination: Radiological contamination shall be removed under the guidance of the HPT in accordance with Section 10.4, "Decontamination of Personnel and Personal Property," of the EG&G Company Procedures Manual, Vol. II, and Section 10 of the generic HSP. Decontamination procedures will be posted on site.

A.10.2 Decontamination of Sampling and Monitoring Equipment

Sampling equipment (including scrapers, spoons, hand augers, sludge samplers, and mixing tray) will be thoroughly decontaminated before and after sampling to reduce the likelihood of cross-contamination. Field teams will use only unused or previously decontaminated equipment and will later decon all equipment as a group. The sampling equipment will be surveyed for radiological contamination before sampling to ensure that cross-contamination of radionuclides will not occur. The rinsate will be collected from the

surveyed piece of equipment prior to sampling. Equipment decontamination will use the following method:

- Wash equipment thoroughly with Alconox (nonphosphate detergent) water solution
- Rinse with potable solution
- Rinse with ASTM Type II (or equivalent) quality reagent water
- Allow equipment to dry until solvents have evaporated
- Wrap equipment in aluminum foil (shiny side out) until ready for use.

Industrial hygiene and radiological survey equipment will be decontaminated (if necessary) according to procedures identified by the IH/HSO and HPT, respectively. All materials and equipment will be surveyed by an HPT per Section 10.11, "Monitoring Radioactive Contamination for Control of Materials and Equipment," of the EG&G Company Procedures Manual, Vol. II. The HPT will verify that the equipment and materials meet the requirements for uncontrolled release specified in Section 4.0, "Radioactive Contamination Control," of the EG&G Radiological Controls Manual.

A.10.3 Decontamination Modification

Any field changes will be incorporated using a Document Revision Request and following the procedures outlined in ERD Program Directive (PD) 4.1, "Document Control and Processing of Document Revision Requests."

A.10.4 Disposal Procedures

All disposable sampling equipment and supplies, decontamination solutions, and PPE (except respirators) shall be placed in a labeled bag or other container and left on site pending sample analysis results which will determine disposal options. Once the nature of the waste is known, contaminated materials will be disposed of accordingly (see Section 3.3.5 of the Sampling and Analysis Plan for Characterization of Potential Waste Sources at Auxiliary Reactor Area-I Operable Unit 5-07 Sites ARA-02 and ARA-03

(EG&G 1992a). Waste materials will be surveyed by an HPT per Section 10.11 of the EG&G Company Procedures Manual, Vol. II, to verify that the materials meet the requirements of Section 4.0 of the EG&G Radiological Controls Manual, for uncontrolled release.

A.11 Emergency Procedures, Equipment, and Information

A.11.1 Emergency Reference List

Warning Communications Center (WCC) 526-1515
ARA-I Emergency Action Director
T. N. Thiel 525-5954
ARA-I Facility Landlord
T. N. Thiel 525-5954
First Aid (CFA Clinic - Bldg. CFA-603) 526-2356
Occupational Medical Program (WCB Clinic) 526-1596
Ambulance 777
Fire 777
Security 777
Safety Engineer Support:
- Industrial Hygiene/Safety
R. T. Evans (CAU IH/HSO) 526-5741
Health Physics
R. D. Sayer (Facilities and Maintenance
Radiological Controls Manager - CFA) 526-6619
FTL/JSS
S. L. Pickett 523-1171
WAG-5 Project Manager
R. J. Bargelt 525-5888

Note: This emergency reference list will be maintained onsite as part of this HSP and will be taped or pasted into the field sampling logbook.

A.11.2 Emergency Routes

The nearest medical facility is the clinic located at CFA. The nearest emergency response teams (fire and ambulance) are also located at CFA. Figure A-6 shows the location of these facilities at CFA, while Figure A-7 shows the relative location of ARA on the INEL, respectively. Figure A-8 is a map provided to assist project personnel in getting from the task site to the

CFA medical clinic. These figures will be posted at the task site in the designated warmup/meeting zone (ARA-I facility guardhouse). The project FTL/JSS (or designate) will inform the medical and emergency response facilities of the nature of site activities and the potential types of chemical and radiological contamination that may be encountered.

In case of medical emergencies, area personnel will gather at the ARA-I guardhouse located at the facility boundary at the Fillmore Blvd. access. There are no telephones in operation at the ARA facilities; the HPT and FTL/JSS will be capable of maintaining communications with the medical facility, emergency response teams, and others by means of a portable F-net radio communication system. In an emergency event the FTL/JSS will begin emergency notifications and response or personnel evacuation if necessary. The main evacuation route will be northwest along Fillmore Blvd. to CFA (see Figure A-8).

INEL Medical Facility: Medical emergencies will be handled by the clinic at CFA-603. Notification will be performed by notifying the clinic directly, by calling WCC, or by contacting the shift manager.

Note: This information will be placed in the field sampling logbook.

A.11.3 Emergency Procedures

A.11.3.1 Additional and/or Modified Emergency Procedures: The F-net radio communication system will be available at the work site at all times; at a minimum, the HPT and the FTL/JSS will have access to an F-net radio at all times. The F-net radio communication system will be provided by the HPT. Additional radios will be secured from the CFA radio shop if necessary. The HPT or IH/HSO will be in constant view of and vocal contact with all members of the field team during sampling. A portable eye-wash station, a basic spill kit, a radiological spill kit, and a 17-lb ABC fire extinguisher will be available at the work site at all times. A transportation vehicle will also be in close proximity and accessible during the entire sampling project. Hand

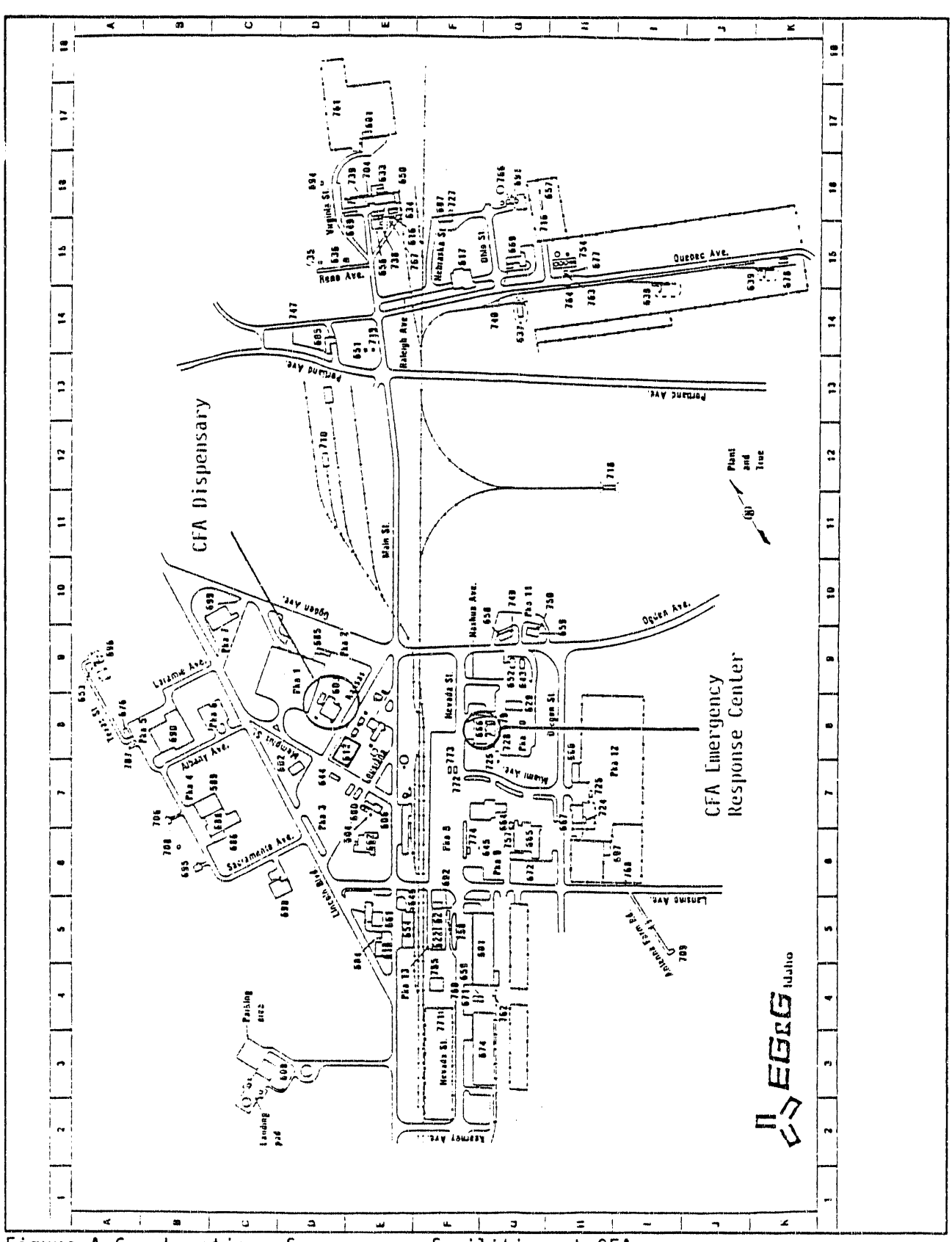

Figure A-6. Location of emergency facilities at CFA.

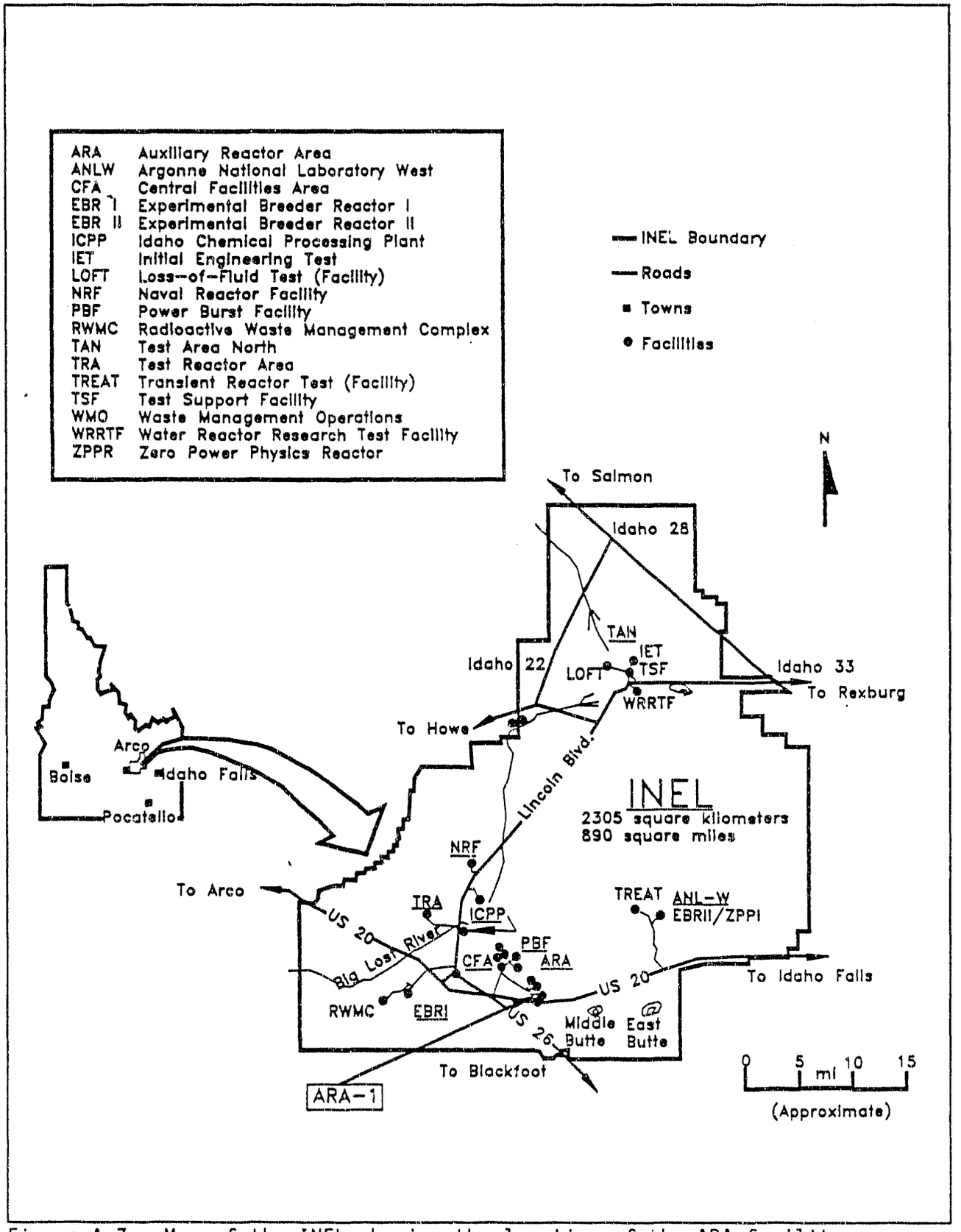

Figure A-7. Map of the INEL showing the location of the ARA facility.

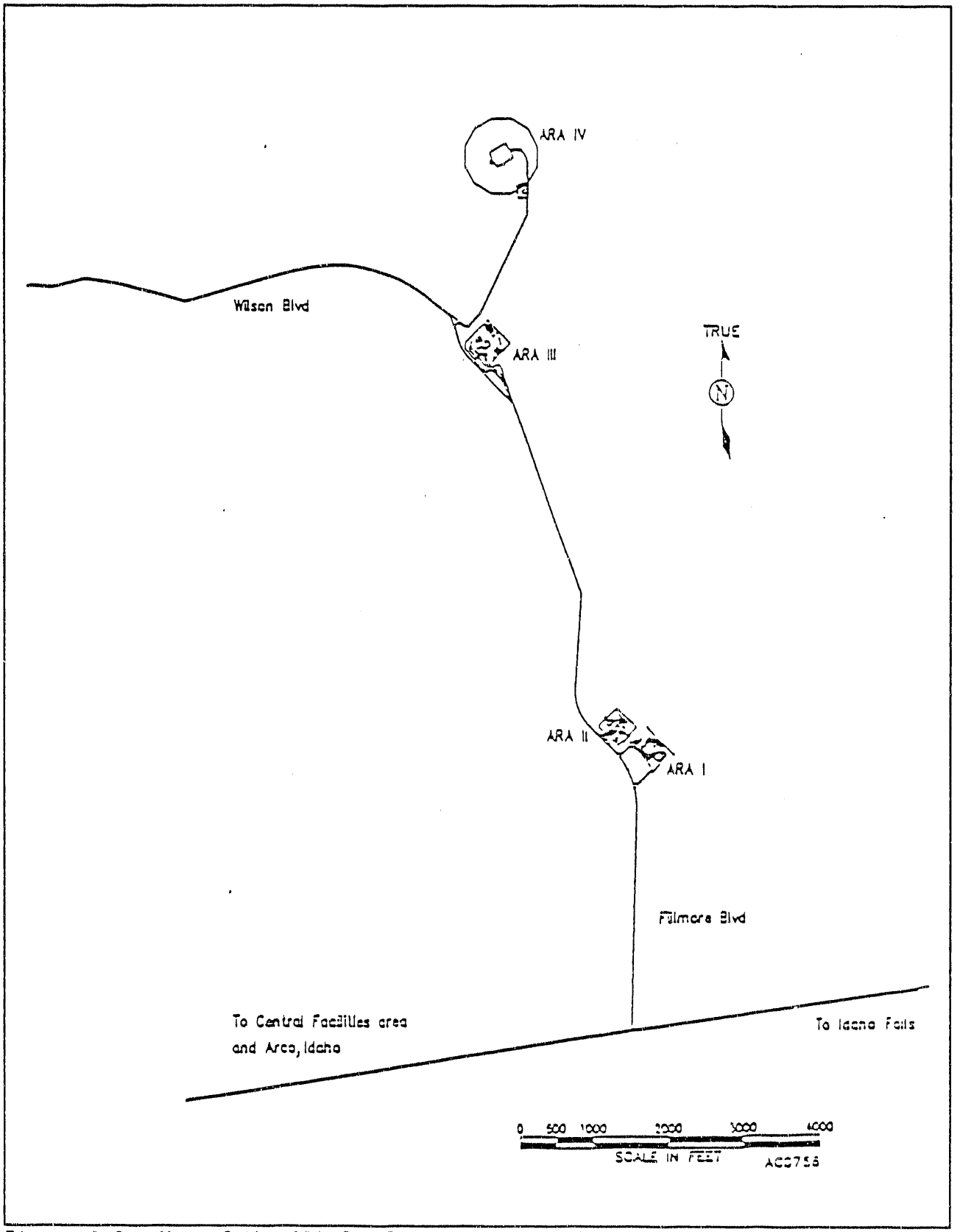

Figure A-8. Map of the ARA facilities showing the intermediate route from task site to CFA medical clinic.

signals and the buddy system, per section 11.1.7 of the generic HSP (Morton 1991), will be reviewed and followed in an emergency.

A.11.3.2 Requirements for Task Site Evacuation: Sampling will be shut down if the IH/HSO and/or HPT determine that the radiological, chemical, biological, or physical hazards are unacceptable. Action levels are stated in Section A.6.3. Since the ARA Facility is currently inactive, no sirens or alarms are expected from the facility. The signal to stop work and evacuate the site shall be by voice or by three blasts from a hand-held air horn or vehicle horn. The Power Burst Facility (PBF) evacuation warning system can be heard from the ARA facility and will be heeded as appropriate. If an evacuation is performed, site personnel will cease work, exit the work zone, and move to the vehicle parking area where the FTL/JSS will provide further instruction. The evacuation will be upwind and to the appropriate staging area. The FTL/JSS will evaluate and establish evacuation routes prior to the start of site activities. This information will be presented to all personnel associated with the sampling project at the pre-job briefing to be conducted before sampling commences.

Emergency sirens from nearby facilities shall be followed in accordance with the EG&G emergency preparedness policy. Personnel may communicate with other facilities via F-net radio.

A.11.3.3 Task Site Warning Devices:

- Portable two-way radio will be available at all times at the site
- Portable air horns or vehicle horns
- Voice (megaphone amplified) and hand signals
- Emergency sirens from nearby facility.

A.11.3.4 Task Site Emergency Responsibilities: In case of an emergency at the task site, the FTL/JSS shall contact the nearest emergency response facility and inform them of the situation.

Name	Responsibility	Action
S. L. Pickett	FTL/JSS	Direct task site emergency
R. T. Evans	IH/HSO	Recommend protective measures
CFA HPT	HPT	Recommend protective measures

A.11.3.5 Reentry Procedures: When a task site emergency results in the evacuation of the task site, personnel shall reenter in accordance with Section 11.1.10 of the ERD generic HSP (Morton 1991).

A.11.4 Emergency Equipment

Fire Extinguisher No.: 2
- Location(s): Inside sampling vehicle
- Maintenance Schedule: Monthly
- Responsibility: FTL/JSS

SCBAs No.: 2
- Location(s): HPT vehicle
- Maintenance Schedule: Monthly
- Responsibility: CFA HPT

First Aid Supplies (See A.11.4.1) No.: 1
- Location(s): Inside sampling vehicle
- Maintenance Schedule: Monthly
- Responsibility: FTL/JSS

Radiological Spill Kit No.: 1 each
- Location(s): Inside sampling vehicle
- Maintenance Schedule: Monthly
- Responsibility: CFA HPT

The kit shall contain the following radiological control equipment at a minimum:

- Plastic bags
- Absorbent materials
- Latex gloves and glove liners

- Plastic shoe covers and/or rubber overshoes
- Smear paper and holders
- Pencils, grease pencils, and paper
- Radiological tags and signs and radiation rope or ribbon
- Yellow plastic sheeting and duct tape.

Liquid/Chemical Spill Kit No.: 1 each

Location(s): Inside sampling vehicle
Maintenance Schedule: Monthly
Responsibility: IH/HSO

The kit shall contain the following spill control equipment at a minimum:

- Plastic bags
- Absorbent pads
- Latex gloves and glove liners
- Plastic shoe covers and/or rubber overshoes.

Portable Eyewashes No.: 1

Location(s): Inside sampling vehicle
Maintenance Schedule: Monthly
Responsibility: FTL/JSS

The person assigned responsibility for each piece of emergency response equipment or supplies is responsible for ensuring that the equipment is in working order and has been properly maintained and calibrated. The responsible person will also ensure that any used supplies are replenished.

A.11.4.1. First Aid Supplies: The first aid kit to be used is approved by the OMP. The designated IH/HSO will be notified if any items are used or removed from the kit so that the kit can be replenished.

A.12 ADDITIONAL INFORMATION

None.

A.13 REFERENCES

EG&G Idaho, Inc., Company Procedures Manual, Volume II, current issue.

EG&G Idaho, Inc., Industrial Hygiene Manual, current issue.

EG&G Idaho, Inc., Radiological Controls Manual, current issue.

EG&G Idaho, Inc., Safety Manual, current issue.

EG&G Idaho, Inc., 1992a, Sampling and Analysis Plan for Characterization of Potential Waste Sources at Auxiliary Reactor Area-I Operable Units 5-07 Sites ARA-02 and ARA-03, EGG-WM-10187, March.

EG&G Idaho, Inc., 1992b, Summary Report for the Initial Characterization of Potential Waste Sources at ARA-I and ARA-II (COCA Units ARA-03, ARA-07, ARA-08, ARA-09, ARA-10, ARA-11, and ARA-19), EGG-WM-10182, April.

EG&G Idaho, Inc., 1986, Installation Assessment Report for EG&G Idaho, Inc., Operations at the Idaho National Engineering Laboratory.

Morton, S. L., 1991, Health and Safety Plan for Operations Performed for the Environmental Restoration Program, EGG-WM-8771, Revision 2, October.

A.14 HEALTH AND SAFETY CERTIFICATION FORM

Task Title: Characterization of Potential Waste Sources at Auxiliary Reactor Area-I Operable Unit 5-07 Site ARA-02

Waste Area Group 5 Manager: R. J. Bargelt

Project Manager: R. J. Bargelt

Field Team Leader: S. L. Pickett

I certify that I have been given a copy of the Task Specific Health and Safety Plan for the **Characterization of Potential Waste Sources at Auxiliary Reactor Area-I Operable Unit 5-07 Site ARA-02** and agree to comply with the procedures described therein. I further certify that I understand the potential health and safety hazards of the program (as outlined in this health and safety plan) and have been trained in the use of the personal protective equipment selected for these tasks.

Employee:

(Print) (Signature) (Date)

Field Team Leader:

(Print) (Signature) (Date)

Health and Safety Officer:

(Print) (Signature) (Date)

APPENDIX A

APPENDIX A

ALARA REVIEW AND EVALUATION

To ensure radiation exposure and radiological contamination is controlled to levels that are as low as reasonably achievable (ALARA), an ALARA review and evaluation was conducted. The ALARA program is described in Chapter 2.0, "External Radiation Exposure Control," of the EG&G Idaho, Inc. *Radiological Controls Manual*. The ALARA review and evaluation is presented in the following pages. The sections requiring post job review will be filled in upon project completion.

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APPROVED: M. S. Jango	R&S Manager

EFFECTIVE DATE: 12/27/91 DRR RC–47

APPENDIX 2.A

ALARA REVIEW AND EVALUATION

1. INTRODUCTION

This appendix provides the subject matter that should be addressed and formats to be used when conducting an ALARA review and approval of work packages, procedures, etc.

2. RESPONSIBILITY AND PROCEDURE

Radiological Engineer

2.1 With the assistance of the Job Requester, review the work package, procedure, etc., using the attached ALARA Pre–Job Review Checklist (Figure 1) as a guide.

2.2 Document the review and the recommendations by filling out an ALARA Review Form, similar to Figure 2, per the following instructions. (The following numbers correspond to those on the ALARA Review Form, Figure 2.)

1. Fill in the assigned job or SWR number that is unique to the job being reviewed.
2. These are the ALARA criteria. If the facilities' procedures specify criteria that are different, make the appropriate changes.
3. Mark the appropriate boxes, that indicate the need for an ALARA review.
4. Enter a description of the job and the job's specific location.
5. Obtain this information from engineers, job supervisors, or workers who have performed the actual job (or similar jobs), and who have a good estimate for how long the job will actually take.
6. The ALARA Review Number is for local recordkeeping purposes. Keep an index and file of ALARA reviews easily accessible in each facility area office. Use the numbering system Area–year–XX (e.g., ATR–91–01).
7. Obtain this information from the HP office.
8. Using the ALARA Pre–Job Review Checklist, obtain input from job supervisors, engineers, HP personnel, and the job requester. From this information, list the ALARA recommendations that should be followed, performed, completed, etc., in order to keep personnel exposure to radiation, and personnel and area exposure to contamination spread ALARA. The ALARA Review Form with recommendations should be attached to the job package, procedure, etc. Also, a copy should be sent to the HP office.
9. Obtain this information from the area HP office. The information is available in the form of health physics log entries, survey maps, and completed SWPs.
10. Using the ALARA Post–Job Review Checklist, check with the job supervisor, HPTs, workers, etc., and compare their comments, if any, with the final radiological results. From this information, list appropriate comments. Address locally correctable problems as they occur.

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ALARA PRE-JOB REVIEW CHECKLIST

Job Requester and Radiological Engineer discuss applicable items; mark each item with "NA", "Yes", or "No". Make comments if necessary.

1. GENERAL

a. Will Health Physics have the manpower available to support the job on the scheduled date? ... Yes

b. Can the work be broken into smaller work elements to reduce total exposure? ..... Yes

c. Would the use of special tools (extensions, remote handlers, etc.) be useful for handling highly radioactive items? ..... Yes/N/A

d. Have provisions been made to handle removed radioactive items and waste (bag, box, store, dispose, etc.)? ..... Yes

e. Review worker(s) current exposure history. Is the remaining allocation adequate to complete the job without extension? ..... Yes

f. Have provisions been made to keep the work area neat and orderly (remove radioactive waste, equipment, material, tools, and debris as it is generated so it won't interfere with the work)? ..... Yes

g. If liquid effluents are generated, are adequate storage, processing, and disposal services available? ..... Yes

2. WORK LOCATION

a. Would maps or photographs of the job area help in worker training? ..... Yes

b. If this is not routine work, would a mock-up be useful? ..... No

c. Have all portions of this job that can be reasonably performed outside the work area been specified (prefab, removal of the items from the radiation area, etc.)? ..... Yes

d. Have environmental conditions (lighting, ventilation, temperature, etc.) been considered for their contribution to worker comfort? ..... Yes

e. If necessary, will all services required for the job (breathing air, electrical power, lights, welding leads, etc.) be staged and placed in protective sleeving in advance? ..... NA

f. Are all tools and parts to be used on the job listed and/or available before the job starts? ..... Yes

g. Is breathing air equipment certification current? ..... Yes/N/A

3. WORKER CONDUCT

a. Is the manpower for this job adequate? ..... Yes

Figure 1. ALARA pre-job review checklist.

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b. Could fewer workers do the job just as effectively? ..... No

c. Is there a written work procedure? ..... Yes

d. Are the workers familiar with the procedure? ..... Yes

e. Are all steps necessary? ..... Yes

f. Is there a need for a briefing with the workers, supervisor, and HP before the job starts? ..... Yes

g. Will the communications methods between workers and supervisors during the work evolution be adequate (need headphones, walkie–talkie, speak E–Zs, etc.)? ..... Yes

h. Will the workers be easily identifiable while in anti–Cs in the work area? ..... Yes

4. RADIOLOGICAL CONDITIONS

a. Is the use of temporary shielding to reduce radiation levels feasible (see Radiological Controls Manual, Chapter 2, Subsection 3.8.3) ..... N/A

b. Will decontaminating the area reduce exposure rates? ..... No

c. Will flushing the associated lines reduce the exposure rates? ..... N/A

d. Would waiting for decay result in economic exposure rates? ..... No

e. Have special local ventilation controls been considered to provide positive air–flow control and reduce airborne radioactivity and contamination spread (air–sweep system, vented glove bags, filtered exhausts, etc.)? ..... N/A

f. Have special local containment controls been considered to contain liquids and prevent the spread of contamination (glove bags, tents, catch and drain basins, etc.)? ..... Yes

g. Would protective coatings on tools (sleeving, bags, tape, etc.) be productive to prevent tool contamination and minimize decontamination efforts? ..... Yes

h. Have provisions been made to decontaminate tools and equipment that are to be removed from the area? ..... Yes

i. Have hot spots in the work area been tagged so workers can avoid these high radiation areas? ..... Yes

j. Are workers aware of lower–dose waiting/resting areas near the work area? ..... Yes

k. Would permanently designed and installed shielding be feasible to reduce radiation levels? ..... N/A

l. Have all aspects of this job been considered that may cause higher than estimated exposure? ... Yes

m. Has previous work in this area been reviewed for exposure rate history? ..... Yes

Figure 1. (continued).

n. Will the nature of the job call for special types of respiratory protective equipment, anti–C protective clothing, or dosimetry? ..... Yes

o. Is special anti–C clothing donning and removal area (tent, etc.) needed to minimize personnel contamination? ..... No

5. ALARA POST–JOB REVIEW CHECKLIST

a. Did anything unexpected or unplanned happen during the performance of the work? If so, explain. ..... ___

b. Would you recommend any equipment or procedure modification that would help reduce dose rates? ..... ___

c. Would you recommend any equipment or procedure modification that would help reduce stay times? ..... ___

d. Would you recommend any equipment or procedure modification that would help reduce the number of entries? ..... ___

e. Would you recommend any equipment or procedure modification that would help reduce contamination spread? ..... ___

f. Would you recommend any equipment or procedure modification that would help reduce total person–rem exposure? ..... ___

g. Were the exposures received during the performance of this work as low as reasonably achievable? If not, explain. ..... ___

Figure 1. (continued).

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ALARA REVIEW FORM CONTENT

SHEET 1

REQUESTER

1. **Job/SWR Number**

2. **ALARA CRITERIA:**

3. Total Dose Equivalent: [ ] >0.1 man-rem/day [ ] >0.5 man-rem/job

[ ] General radiation levels >100 mR/hr, beta-gamma + neutron No

[ ] Contamination level >20,000 dpm/100 cm^2, beta-gamma

[ ] Contamination level >250 dpm/100 cm^2, alpha

[ ] Work evolution may cause uncontrolled airborne activity levels to exceed limits (DACs)

[✓] Opening or entering a system where radiation and/or contamination levels may exceed those already specified.

[ ] Other (specify)

4. **JOB DESCRIPTION AND LOCATION**

5a. Maximum number of workers at job site at one time 5

5b. Estimated total manhours at job site 60

Job Requester Signature [signature] Phone Number 523-1171

RADIOLOGICAL ENGINEER – PRE-JOB REVIEW

6. **ALARA Review Number**

7. **RADIOLOGICAL CONDITIONS (to be supplied by HP):**

Current
Radiation: 2.0 mR/hr (general)
Radiation: 40.0 mR/hr (contact, hot spots)
Radiation: N/A mrad/hr β
Contamination: βγ N/A dpm/100 cm^2 ∝ N/A dpm/100cm^2
Air Activity: 4.2E-07 µCi/cc βγ, α
4.2E-12 uCi/cc ∝ Contamination level (soil samples)

Expected - same as current conditions
Radiation: _____ mR/hr (general)
Radiation: _____ mR/hr (contact, hot spots)
Contamination: _____ dpm/100 cm^2 βγ,α
Air Activity: βγ ___ µCi/cc ∝ _____ µCi/cc

8. **RADIOLOGICAL REVIEW RECOMMENDATIONS:**

U235 1.02E-04 uCi/g
Cs137 3.75E-04 uCi/g
Co60 6.04E-03 uCi/g

[✓] See Continuation Sheet:

Radiological Engineer Signature [signature] Date 4/9/92

(Copies to HP supervisor, job package and Radiological Engineer file)

Figure 2. ALARA review form content.

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RADIOLOGICAL ENGINEER – POST–JOB REVIEW

9. RADIOLOGICAL CONDITIONS–ACTUAL (to be supplied by HP):

Radiation: _____ mR/hr (general)
Radiation: _____ mR/hr (contact Hot Spots)

Contamination _____ dpm/100 cm^2
Person–rem/job: _____ (per self–reading dosimeter)
Air Activity: _____ µci/cc βγ
Air Activity: _____ µci/cc ∝

10. POST–JOB COMMENTS:

[ ] See Continuation Sheet

Radiological Engineer Signature _____ Date _____

Figure 2. (continued).

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ALARA REVIEW FORM CONTENT

SHEET 2

Job/SWR Number _____ **ALARA Review Number** _____

RADIOLOGICAL ENGINEER–PRE – JOB REVIEW

8. RADIOLOGICAL REVIEW RECOMMENDATIONS:

Recommend personnel have Zone II contamination protection for any sampling activities. This will include full-face respirator. The use of respirators is not only for respiratory protection, but to prevent skin contamination. If levels are low enough to warrant a reduction in requirements, the HPT may reduce the requirements to Zone I protection levels.

If personnel must enter the manholes to obtain samples, HEPA filtered ventilation must be installe This requirement is part of the Safety Analysis Report for all of ERDs sampling and drilling activities.

Inside one manhole direct radiation levels at contact are 40 mR/hr. At ground surface radiation levels are expected to be < 1.0 mR/hr; however, soil samples taken in Jan. '92 had levels up to 4 mR/hr.

In addition to the hazards associated with the manholes, at least two tanks will be sampled. No preliminary data exists on the contents of the tanks. Therefore, if levels in the tanks create exposure levels to personnel in excess of 15 mR/hr (including samples); work must stop and additional analysis performed and recommendations made for personnel protection.

Based on previous samples (4 mR/hr) and the estimated manhours at the job site (60 hours); the total manRem of 0.24 will be used for these activities. ALARA principles will be implemented to reduce personnel exposure and no person is to exceed his/her ALARA goal.

Radiological Engineer Signature _____ Date 4/14/92

RADIOLOGICAL ENGINEER – POST–JOB REVIEW

10. POST–JOB COMMENTS:

Radiological Engineer Signature _____ Date _____

Figure 2. (continued).

END

DATE FILMED 9/17/92